The Impact of the Canadian Standardized Test of Fitness and of Health Counselling on Health Attitudes and Behaviour

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Abstract

The purpose of this research study was to determine whether or not the use of a single day of Personal Wellness Evaluations would be meaningful enough to change the attitudes of participants toward adopting a healthier lifestyle, or if it was necessary to include regular planned health counselling along with the Personal Wellness Evaluations in order to observe changes in beliefs, attitudes and behaviours toward active living and the adoption of a healthier lifestyle.

Attitudes and behaviours toward physical fitness and healthy lifestyle choices were assessed through a questionnaire composed of the following instruments: Fishbein and Ajzen Attitude and Behaviour Questionnaire, Leisure Behaviour Questionnaire, Ten Centimeter Bipolar Health Continuum, Neugarten Life Satisfaction Assessment, Job Description Index, Selected questions from the Ontario Health Survey, and the Symptom Reporting Questionnaire. Physical fitness evaluation consisted of the Canadian Standardized Test of Fitness, measures of blood pressure, and total cholesterol. The participants were divided into three groups: Group 1- CSTF & health counselling, Group 2- CSTF only, and Group 3- a control group. All three groups received the questionnaire both at the beginning and at the end of the study. Group 1 and Group 2 also participated in fitness testing at these same times, with a three-month time interval between test times. Group 1 also received weekly one-hour health education sessions during the three months between fitness testing.

While there were some differences found between the three groups in this study, the results of this study suggested that this three-month workplace wellness program had no impact on the participants' attitudes and behaviours toward health and physical activity. There were no significant differences in the physical fitness measures between Group 1 and Group 2 , nor in the participants' questionnaire responses. These results may be due to the participants' lack of compliance to this wellness program. Employees who

participate in a workplace wellness program must be self-motivated to comply with the program in order to receive the full benefits the program has to offer. Some participants in this study did not have the internal motivation necessary to remain in the study for the three-month period. Future research may consider implementing a workplace wellness program for a longer duration as well as incorporating a specific physical fitness program for the participants to follow. An exercise program could improve the participants' physical fitness, while the health counselling would give the individuals the health education necessary to lead a healthy lifestyle.

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CHAPTER ONE: THE PROBLEM

Introduction

The health of the employees determines the health of the organization. In order to have a healthy organization, employers must first develop strategies to enhance the health of their workers (Chenoweth, 1991; Dejoy & Wilson, 1995; Falkenberg, 1987). Increased interest in creating a healthier workforce has led to the implementation of employee health and fitness programs in several corporations (Chenoweth, 1991; Falkenberg, 1987; Bernacki & Baun, 1984, Bly, Jones & Richardson, 1986). The rationale underlying the development of health and fitness programs is based on research studies which indicate that such programs lead to an increase in corporate morale, a decrease in absenteeism, an increase in productivity, and a decrease in health care costs (Shephard, Corey, Renzland & Cox, 1982; Shephard, Cox & Corey, 1981; Gettman, 1986). Health and fitness programs provide employees with access to health counselling and specific facilities that allow the individual to achieve a healthier lifestyle (Chenoweth, 1991; Falkenberg, 1987). Typically, the three programs which emerge from corporate wellness strategies are: 1) Employee Assistance Programs (EAPs); 2) Managed Health Care (MHC); and 3) Health Promotion Programs (HPPs) (Dejoy & Wilson, 1995). The EAP is designed to alleviate problems which may emerge within the workplace. The MHC refers to management of health care programs and services for the individual within the workplace. Managed health care is associated with health maintenance organizations which are typically a part of the compensation and benefits office within either the personnel department of human resources department of many corporations (Dejoy & Wilson, 1995; Redican, Baffi & Wessel, 1994). Health promotion programs are generally the most popular workplace wellness strategies (Dejoy & Wilson, 1995). Health promotion programs include health risk appraisals and strategies for reducing health risks (Dejoy & Wilson, 1995). While health promotion programs often include exercise classes, it should not be assumed that the health promotion program is

synonymous with noon hour exercise and fitness classes. Rather, in addition to planned exercise programs/classes, the health promotion program may include nutrition information sessions, injury prevention sessions, smoking cessation programs, healthy back care sessions, and other issues related to the benefits of active living (Fielding & Piserchia, 1989).

Workplace wellness strategies have proven to be cost effective (Shephard, 1983; Gibbs, Mulvaney, Henes, & Reed, 1985; Erfurt, Foote & Heirich, 1992) and are accepted positively as an important part of the workplace community by many corporations Shephard, 1983). Several authors reported that employees who participated in an employee wellness program improved health attitudes and demonstrated positive behaviours toward physical activity (Shephard, Morgan, Finucane & Schimmelfing, 1980; Breslow, Fielding, Herrman & Wilbur, 1990), decreased stress levels (Imm, 1990; Falkenberg, 1987), improved self-confidence (Imm, 1990; Rhodes & Dunwoody, 1980), and increased job satisfaction (Rhodes & Dunwoody, 1980). In general, research indicates that participation in an employee health promotion program or workplace wellness strategy encourages employees to lead healthier lifestyles.

Companies are more likely to benefit from a healthy workforce (Shephard, 1992) that has employees who strive to achieve positive, active, lifestyles, both at work and outside the workplace. Previous research showed that organizations could enhance their productivity and social environment by introducing workplace strategies that include exercise and health promotion programs (Bowne, Russell, Morgan, Optenberg & Clarke, 1984; Wright, 1982). Generally, previous research indicated that benefits to a company would not only be an increase in productivity (Howard & Mikalachki, 1979; Shephard, 1989; Posyniak & Kummerfield, 1992), but such benefits would also include a decrease in the amount of days of absenteeism within their organization (Baun, Bernacki & Tsai, 1986; Linden, 1969; Donoghue, 1977; Song, Shephard, Cox, 1982 & Tsai, Baun, Bernacki, ; Shephard, 1989; Posyniak & Kummerfield, 1992), and decreased health care

costs for the employee and the company (Shephard, Corey, Renzland & Cox, 1982; Bly, Jones & Richardson, 1986; Bowne, Russell, Morgan, Optenberg & Clarke, 1984, Shephard, 1989; Posyniak & Kummerfield, 1992).

Workplace wellness strategies are generally presented by designated individuals within the human resources departments of business and industry (Dejoy & Wilson, 1995; Chenoweth, 1991). The mandate of such individuals is to provide selected programs of employee assistance, managed health care, and health promotion within a strategy of overall workplace wellness. Yet, the success of programs offered within the workplace wellness strategy are neither guaranteed nor random. Rather, the success of a workplace wellness strategy depends on the planning and presentation of the various programs offered by the workplace wellness office. It remains unclear, however, as to what the exact stimulus will be which initiates change toward a healthier lifestyle by employees. The present research study was designed to determine if healthier lifestyle changes could be initiated merely by assessing fitness levels and providing feedback, or if the change to a healthier lifestyle would require continual feedback about health issues through planned health education or information sessions.

Problem Statement

The primary purpose of this research study was to determine whether or not the use of a single day of Personal Wellness Evaluations, which included measures of cardiovascular fitness, blood cholesterol, percentage of body fat, strength, and flexibility, would be meaningful enough to change the attitudes of participants toward adopting a healthier lifestyle, or if it would be necessary to include regular planned health counselling along with the Personal Wellness Evaluations, in order to observe changes in beliefs, attitudes and behaviours toward active living and the adoption of a healthier lifestyle.

Rationale for the Study

Physical fitness tests that are part of Personal Wellness Evaluations are useful in that they can provide information about an individual's physical health and his/her ability to cope with physical and emotional stresses which may emerge in the workplace. However, physical fitness tests alone do not indicate whether an individual currently leads a healthy lifestyle or whether or not the individual's current lifestyle will prevent the onset of health-threatening diseases such as lung cancer or emphysema caused by smoking, atherosclerosis caused by sedentary lifestyle, or liver problems associated with alcohol use.

Beliefs, attitudes and behaviours are essential determinants of health. Beliefs, attitudes and behaviours may be considered either separately or together, as influencing an individual's lifestyle and, subsequently, the individual's health. Further, each of these components (beliefs, attitudes and behaviours) can be changed through workplace wellness strategies, and the measurement of such change can be evaluated through a Personal Wellness Evaluation within the workplace, or as part of a wellness program. For example, several authors have reported that employees who participated in a health promotion program showed improved attitudes toward healthier practices, and positive intentions toward physical activity (Shephard, Morgan, Finucane & Schimmelfing, 1980; Breslow, Fielding, Herman & Wilbur, 1990). Yet, more important, involvement in workplace wellness programs has been associated with decreases in perceived stress levels (Imm, 1990), improved self-confidence (Imm, 1990; Rhodes & Dunwoody, 1980), and increased job satisfaction (Rhodes & Dunwoody, 1980). In general, previous research has indicated that participation in workplace wellness programs that promote healthier lifestyles for employees, produces a workplace in which employees are more likely to adopt the proposed healthier lifestyles. The importance of such adopted lifestyle changes is critical to the company in that these changes are usually associated with a healthier bottom line as a result of increased productivity (Howard & Mikalachki, 1979;

Shephard, 1995), decreased average number of days for absenteeism (Baun, Bernacki & Tsai, 1986; Cox, Shephard & Corey, 1981; Linden, 1969; Donoghue, 1977; Song, Shephard, Cox, 1982; Tsai, Baun, Bernacki, 1987), and decreased health care costs for the employees and the employer (Shephard, Corey, Renzland & Cox, 1982; Bly, Jones & Richardson, 1986; Bowne, Russell, Morgan, Optenberg & Clarke, 1984).

Research Hypothesis

Considering three independent groups, where Group 1 will receive fitness testing on Day One and three months later, and health education counselling once per week for three months; Group 2 would receive fitness testing on Day One and three months later; and Group 3 would be designated as the group of control subjects; there would be no difference in responses to a generalized health questionnaire across the three groups; and there would be no differences in fitness test results between Group 1 and Group 2 on Day One and after three months.

Secondary Research Questions

The main questions studied in this research project were: did the factors determining 1) attitudes to exercise and health, and 2) exercise and health behaviour remain unchanged three months after completion of the CSTF and, did responses differ between subjects performing the CSTF alone and those subjects receiving additional screening (blood pressure, cholesterol), counselling and education?

Limitations and Delimitations of the Study

Limitation #1:

Some individuals dropped out of the workplace wellness program

Delimitation #1:

Participants were encouraged to stay with the program until the end of the three months. Participants were contacted through the companies' inter-office mail and were

informed of the importance of their participation in this research project and also of the impact this project would have on their lifestyles.

Limitation #2

Not all participants attended all of the health education classes due to other scheduled meetings or due to vacation time.

Delimitation #2:

Participant attendance was taken at each health education session. The information pertaining to the health education session (i.e., handouts, pamphlets, etc.) was then given to those participants who were absent at the next health education session.

Limitation #3

The fitness testing could be too rigorous; therefore, participants could drop out of the testing.

Delimitation #3

Participants would only complete as much of the fitness testing that they felt they were capable of completing. Once participants felt they could no longer continue with the testing they could stop the fitness test.

Limitation #4

Some individuals may not have worked to their fullest potential on the fitness tests.

Delimitation #4:

All of the participants were encouraged to participate fully on the fitness tests. The benefits of working to their maximum potentials were discussed with the participants. This helped to motivate them to complete the tests to the best of their ability.

Limitation #5:

Some participants might not be accurate in recording their fitness test results.

Delimitation #5:

Individuals knowledgeable of the fitness tests and their methodology were present to conduct the testing and they ensured that the tests were carried out properly and also ensured that the proper test results were recorded.

Limitation #6:

Some participants may not have been truthful on their questionnaire.

Delimitation #6:

It was impossible to overlook the completion of every questionnaire. It was assumed that the individuals were being truthful on their questionnaires. The anonymity of the questionnaires would hopefully encourage the participants to be truthful on their questionnaires.

Limitation #7:

Some individuals might have had meetings that conflicted with the testing sessions or the presentation of the Health Education/Counselling sessions.

Delimitation #7:

Fitness testing sessions were held at two different locations on two separate days so that all participants could be tested. Likewise, with regard to health counselling and health education, twice-weekly sessions were presented at two different locations so that most of the participants could attend one of the sessions in a given week.

Limitation #8:

Some individuals might have only agreed to participate in a certain test group, such as Group 1 where the participants were involved in fitness testing, health education and completion of the questionnaire package, or Group 3 where the individuals were required to complete only two questionnaire packages.

Delimitation #8

In order to ensure that there were enough individuals to participate in the study, the allocation of participants to certain groups was not totally random.

Assumptions of the Study

Assumption

Individuals who were presented information about a healthier lifestyle behaviour would adopt the suggested behaviour.

Assumption

Individuals who were given results of their physical fitness tests would start to participate in physical activity to improve their physical fitness level.

Assumption

Individuals who were given the opportunity to participate in a workplace wellness program and gain information pertaining to their health and wellness would participate in the wellness program and complete the full duration of the program.

Definition of Terms

Absenteeism: the amount of time an employee is absent from work.

Attitude To Exercise: a latent or nonobservable, complex, but relatively stable behavioral disposition reflecting both direction and intensity of feeling toward a particular object, whether it be concrete or abstract (Kenyon, 1968, p.567).

Exercise Behaviour: a person's actions toward physical activity, such as how often one exercises and the type of activity.

Benefits of Exercise: the physiological and psychological gains achieved through physical activity, such as improved cardiovascular endurance, or relief of stress.

Exercise Compliance: the ability to adhere to, or comply with an exercise program.

Health: the total of your physical, social, emotional, mental and spiritual status (Greenberg, Dinitman & Oakes, 1995).

Health Behaviour: any specific or general health-promotion and/or disease prevention action (Carroll & Miller, 1991).

Health Counselling: information sessions given to participants educating them on knowledge surrounding healthy lifestyles and wellness.

Health Promotion: movement in which knowledge, practices, and values are transmitted to people for use in lengthening their lives, reducing the incidence of illness, and feeling better (Payne & Hahn, 1995).

Productivity: tangible productivity can be defined as a company or an organization having less absenteeism and more time on the job (Gettman, 1986 p. 11).

Wellness: a broadly-based term used to describe a highly developed level of fitness (Payne & Hahn, 1992).

Workplace Wellness Programs: programs organized within companies that may consist of fitness programs, exercise classes and/or health education sessions.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

Introduction

Poor compliance is one of the main factors limiting the effectiveness of fitness programs in employee fitness programs (Shephard, 1985). Many approaches are used to increase the level of compliance to exercise programs. Some programs use goal-setting, direct contact with participants, or external rewards (Shephard, 1985). However, external motivation is a costly process, and the ideal approach is to develop procedures that will allow an internalization of the behaviour of active living through a change in attitudes, beliefs, motivation to comply and perceived barriers to a more active lifestyle.

In the 1970s, Fitness Canada began advising companies to implement worksite fitness programs and, as a result, sample programs were established (Peepre, 1980; Shephard, 1991). Some programs concentrated specifically upon fitness, while others experimented with various optional modules of health promotion to reinforce the message of active living (Shephard, 1992).

Increasing Employee Physical Activity

In order to increase the active living of employees, program organizers must not only become aware of what attracts employees to a physical fitness program, but programmers need to identify the motivators which will keep participants involved in the programs. Lovato and Green (1990) examined several different aspects used in maintaining employee participation in a workplace wellness program. Conrad (1987) and Fielding (1984) (cited in Lovato & Green, 1990) suggested that participants in worksite health promotion programs were usually nonsmokers, were more interested in their health, knew more about the benefits of exercise and were younger in age than the larger population of employees within a given worksite. Other factors which increased employee participation were: convenience of program (time and place), programs that

were offered during working hours and allowed those individuals with families to participate during the day when it was convenient for them; and satisfaction with the program. When employees were encouraged to get involved with the establishment of the program, such as what programs were offered, or which health issues were discussed, employees were more likely to maintain an interest in the program and continue to participate in it (Lovato & Green, 1990). Lovato and Green (1990) suggested that in trying to maintain employee participation in a fitness program, employees who were committed to a program prior to entering the workplace wellness program were more likely to continue with the program than those employees who were not.

King, Carl, Birkell and Haskell (1988) conducted a study which focused on increasing the exercise levels among blue-collar workers. The participants in this study were 38 men employed at Stanford University. The participants' employment consisted of electricians, auto mechanics, carpenters, painters, steam fitters, plumbers, and sheet metal workers (King et al., 1988). Before this study began, 70% of the participants stated that they were active during the normal working day, 59% stated that they participated in physical activity during their leisure time, and more than 66% stated that they were involved in vigorous physical activity (King et al., 1988).

At the beginning of the King et al. (1988) study, the participants participated in fitness testing which consisted of weight, resting blood pressure, and a step test. These participants were asked to participate in exercise for a duration of 30 minutes three times per week for a 16-week period. This exercise consisted of 19 different activities (e.g., push-ups, chin-ups, walking, running). At the end of the 16-week period, the participants completed the fitness test once again (King et al., 1988). Based on the results of their study, King et al. (1988) found that a health promotion program which is designed to suit the needs of the employees would help increase participation levels among employees. Similarly to Lovato and Green (1990), King et al. (1988) found that the time and location of the program was important in maintaining and increasing

employee participation. Likewise, King et al. (1988) found that the type of physical activity and the support from their supervisors contributed to employee participation.

In a later study, King, Taylor, Haskell, and DeBusk (1990) examined different strategies for increasing employee physical activity levels. Three hundred ninety-nine individuals participated in this second study. The participants were given a survey and asked to categorize themselves as either a current regular exerciser, a past exerciser, or a nonexerciser. Upon completion of the study, King et al. (1990) concluded that the nonexerciser was more likely to be a smoker and more likely to report physical problems that restricted participation in physical exercise on a regular basis (King et al., 1990). King et al. (1990) reported that the nonexercisers reported having little support to participate in physical activity from their family. To improve health promotion programs King et al. (1990) suggested the following: 1) educate employees on ways to improve physical activity, attitudes and beliefs; 2) develop individual programs for the participants; 3) increase social support; 4) meet the needs of both women and men; and 5) meet the needs of the older employee. According to Everett (1979), in order to increase employee fitness levels employers must increase the perceived benefits of exercise and decrease the cost of exercise. Likewise, Epes (1994) suggested 10 steps for employers to follow when implementing a workplace wellness program into their corporation: 1) keep it simple and basic, 2) start gradually, 3) be aware of the interests of the employees, 4) allow family members of employees to participate, 5) make it enjoyable, 6) when scheduling activities, make sure they do not coincide with daily job duties, 7) allow employees to fill leadership positions, 8) recognize achievements, 9) be aware of other health promotion programs and learn from them, and 10) re-evaluate your own health promotion program.

Evaluating Intentions To Exercise/Compliance

Several researchers have investigated which people intend to participate in an employee exercise program (Godin, Beamish, Wipper, Shephard & Colantonio, 1988; Conrad, 1987; Zavela, Davis, Cottrell & Smith, 1988). Conrad (1987) reported on the differences between participants and non-participants in employee health and fitness programs, concluding that employees who participated in employee health promotion programs were initially healthier and were more concerned with physical fitness and health related issues. Conrad (1987) also reported that variables such as age, sex, and the position in the organization may influence an employee's participation in exercise programs. Identifying attitudes toward "intentions to participate" in employee health promotion programs is important when devising an inclusive employee fitness program. Employee fitness programs must not be constructed to attract only the physically fit employee (Zavela, Davis, Cottrell & Smith, 1988).

Some fitness programs have offered their employees incentives or rewards for their participation (Shephard, 1985). When employees first begin a fitness program, the use of incentives and rewards may be a successful way to maintain employees' interest in the program (Shephard, 1985). In some fitness programs, incentives and rewards can be used until the employee feels personal satisfaction in participating in the exercise program and continues to be active regardless of rewards offered by the employer (Shephard, 1985). However, in the long term, employees who begin to exercise for themselves rather than for external motivators will be more likely to continue to exercise both within and outside of the corporate exercise program (Shephard, 1985).

Evaluating Attitudes and Behaviours Toward Exercise

A person's attitude and behavior toward fitness and physical activity is likely to be an indicator of his/her actual level of participation in physical activity. Godin, Cox and Shephard (1983) used the Ajzen and Fishbein (1980) psycho-social model to determine

the impact of physical fitness evaluation and counselling on beliefs, attitudes and intentions to exercise regularly in a group of subjects about to enroll in a worksite fitness program. The participants consisted of 172 adults (98 males and 74 females) who were considered to be white collar employees. There were two groups involved in this study; in one group the participants completed a questionnaire evaluating attitudes and beliefs toward physical activity prior to receiving counselling. In the second group, participants completed the same questionnaire after receiving counselling. As well as completing the questionnaire, the participants also completed the Canadian Home Fitness Test. The results of this investigation showed that the physical fitness testing and counselling had no effect on the participants' intentions to exercise. The investigators suggested that their negative findings were probably due to the fact that the test candidates were largely interested in exercise before starting the investigation (Godin, Cox & Shephard, 1983).

Pender and Pender (1986) used the model of reasoned action developed by Ajzen and Fishbein (1980) to assess the impact of attitudes and subjective norms on intentions to exercise. The participants involved in this study were chosen from a random sample of a population of approximately 30, 000 (Pender & Pender, 1986). The participants completed a questionnaire based on the guidelines developed by Azjen and Fishbein (1980) to evaluate attitudes, behaviours and beliefs toward physical activity. Variables such as age, sex, education, salary, weight and personal health status were also included in the questionnaire. The researchers found that this study provided little support for the theory of reasoned action (Pender & Pender, 1986). The results showed that subjective norms (i.e., perceived social pressures to comply with the norm) had more influence on the participants' attitudes than on their own intentions to exercise (Pender & Pender, 1986).

Understanding individuals' attitudes, beliefs, and behaviours toward physical activity could help those employers who are interested in developing a workplace wellness program within their company. This understanding could help determine what

employees want and need in a wellness program, as well as help give the employer an understanding as to what will keep the employees involved in the program. According to Godin and Shephard (1983), those individuals who are interested in developing a health promotion and physical fitness program should give consideration to methods of changing intentions to exercise.

Use of Employee Fitness / Exercise Programs

Several researchers have suggested ways to help ensure that health promotion programs are successful (Shephard & Cox, 1980; Fielding, 1984). Fielding (1984) discussed several areas that contribute to success of a health promotion program. Four of these were : 1) long-term commitment: a program must run for several years in order to see its true impact on employees, as well as allowing new employees to join; 2) top management support: participants must have full support from their employers and members of higher management; 3) employee involvement: a health promotion program must be developed jointly by both management and employees; and 4) family involvement: family support is important in helping family members improve health-related behaviours (Fielding, 1984). According to Fielding (1984), the following are factors which influence participation in a fitness program within the workplace: age, sex, level of income, hours of work, type of activities available, costs to participate, family involvement, supervision, employee work load, travel time involved in job, and the hours the program is offered.

According to Shephard and Cox (1980) one of the biggest challenges an employer is faced with in developing an employee fitness program is maintaining the interest and participation of the employees. Shephard and Cox (1980) conducted a study evaluating the characteristics of participants in a workplace fitness program. The researchers used the following hypotheses in their study: 1) a particular physical activity would attract individuals with certain body types, 2) the program would attract those individuals who

were already highly physically fit, 3) persons of above average health would enroll in the program, 4) participants would show favourable attitudes to activity experience of the program, 5) those people who had a psychological need would enroll in the program (Shephard & Cox, 1980). The results of the study showed that certain activities did not attract certain body types, that individuals of all physical fitness levels were attracted to the program, that physical and mental health did not influence enrollment in the fitness program, the need for the release of tension was shown by women, and female participation was influenced by other health problems (Shephard & Cox, 1980).

Shephard and Cox (1980) suggested some areas that should be of concern to health promotion programmers: 1) developing the physical activity according to body type; 2) increasing the level of physical activity gradually; 3) examining individual desired outcomes; and 4) flexibility with physical fitness classes to accommodate people with time constraints (Shephard & Cox, 1980).

Personal Benefits

There are several personal benefits to participating in an employee health and fitness program. Imm (1990) examined the perceived benefits of participants in an employee aerobic fitness program. The participants involved in this study were 29 volunteers who were employed at a large industry. Of the 29 participants, 24 were women. These participants took part in 45-minute aerobic dance classes, three days per week, as well as completing a 15-item questionnaire. The attendance for these aerobic classes ranged anywhere from 56% to 89%. According to Imm (1990), the results of the aerobic dance classes were: a decrease in the stress level of employees, an increase in endurance, improved moods, improved perception of self, and increased flexibility. Imm (1990) reported that evaluating the effectiveness of the aerobic dance classes through the use of a questionnaire was difficult because of the possibility of bias.

Rhodes and Dunwoody (1980) conducted a study to determine i) the possibility of establishing an exercise program in the workplace, ii) the physiological and attitudinal changes, and iii) the influences on adherence to an exercise program. There were 70 males involved in this study. These participants took part in the Canadian Home Fitness Test, pulmonary function tests, body assessment, flexibility and strength tests. Of the initial 70 participants, only 40 completed the study. Rhodes and Dunwoody (1980) found that the exercise group had a decrease in body weight, a decrease in pulse rate, improved vital capacity, and increased flexibility. Attitudinal changes in relation to job performance included an increase in concentration, an improved attitude toward the job, and an increase in self-confidence (Rhodes & Dunwoody, 1990). Participants reported that they continued in the employee fitness program because they wanted to feel better, lead a healthier lifestyle, and have fun.

Morgan, Shephard, Finucane, Schimmelfing and Jazmaji (1984) examined the health beliefs, habits and attitudes of participants in the implementation and continuance of an exercise program at a worksite. These investigators examined i) individuals' reasons for volunteering for the study, ii) training response, and iii) the changes in the health behaviours of the participants involved in the study. The participants in the exercise group took part in a physical fitness evaluation as well as completing the same questionnaire pertaining to health beliefs, personality measures, and health and exercise practices. The control group for this study also completed the same questionnaire. Morgan et al. (1984) found that men who took part in this fitness program were younger, had been exercising previous to this study, and believed in the health benefits of exercise. Morgan et al. (1984) also found that women who participated in this exercise program did so because they had positive attitudes toward exercise in that they believed in its health benefits, and they perceived their own health to be poor. After the study was completed, only 50% to 60% of the initial participants in the study continued to participate in physical activity.

Corporate Benefits

Employee health and fitness promotion programs help to decrease health care costs for both a corporation and for society. According to Fielding (1984) health-related problems affect a company's productivity, absenteeism, employee turnover, and medical costs. Betera (1990) estimated that, in the United States illness in the workplace costs approximately $70.8 million annually. Bertera (1990) suggested that among individuals at risk, the illness costs per person had the following breakdown: smoking $960.00, overweight $401.00, excess alcohol $389.00, elevated cholesterol $370.00, high blood pressure $343.00, and lack of exercise $130.00. Bowne, Russell, Morgan, Optenberg and Clarke (1984) examined reduced disability and health care costs in an industrial fitness program and found a reduction in health care costs for employees who participated in the exercise program. The participants in this study underwent a fitness evaluation and were then given a personal fitness program. Upon completion of the program, Bowne et al. (1984) found a 45.7% decrease in the medical costs of those individuals participating in physical activity. Bowne et al. (1984) also found that the cardiorespiratory fitness of the participants improved, and there was a 20.1% decrease in disability absences. The total cost to run this exercise program per employee was $120.60, and the total dollar value saved per employee participating in this program was #353.38. According to Bowne et al. (1984), with lower levels of fitness there is higher health care costs.

Bly, Jones and Richardson (1986) found results similar to those of Bowne et al. (1984) in a study of a health promotion program and health care costs and utilization comparing employees from the Johnson & Johnson organization. Participants at experimental sites engaged in health screening, lifestyle improvement programs, and worksite changes (Bly et al., 1986). There were smaller increases in medical costs and utilization for participants exposed to the health screening and lifestyle improvement programs than for the non-participants at control sites (Bly et al., 1986). Hospital costs

for the test groups doubled over the five-year period, but in the control group hospital costs increased four times the original amount (Bly et al., 1986).

Shephard, Corey, Renzland and Cox (1982) also conducted an investigation that focused on the influence of an employee fitness and lifestyle modification program upon medical care costs. The head offices of two large insurance companies participated in this study. One of the companies participated in an employee fitness program, and the other company remained as the control group for the study. Results of this study showed that the participants who took part in the exercise program had fewer number of hospital days and lower medical costs than the non-exercisers. Savings included an average of 0.57 hospital days per employee-year, plus $28.5 in OHIP claims per employee (Shephard et al., 1982). Shephard et al. (1982) suggested that if the company allowed for $100.00 per day for the hospital, there would be total savings of $84.50 per employee, or a total of $84 500 for a company who had 1000 employees.

Gettman (1986) conducted an investigation to analyze the cost effectiveness of a workplace wellness program at a Mesa Petroleum Company. This investigation looked at employees' physical activity levels, absenteeism, and medical costs. Upon completion of the study, Gettman (1986) found that during 1982, 325 sedentary employees averaged 41 hours of absenteeism. There was a 12-hour difference in absenteeism between the active and the inactive employees which resulted in a $156.00 per employee in salary paid sick time. Gettman (1986) suggested that the active employees had lower medical costs of $173.00 and the sedentary employees had a medical costs average of $390.00.

Sharrat and Cox (1988) cited two studies which found employee wellness programs to be beneficial to the corporation. After implementing a workplace wellness program, a Prudential Insurance Company found a 26% decrease in disability days and a 46% reduction in major medical costs (Sharrat & Cox, 1988). The second study cited by Sharrat and Cox (1988) concerned a Canadian government study which showed an

economic gain of up to $175, 000 due to decreased absenteeism and decreased medical care costs which amounted to approximately $130.00 per employee.

Absenteeism

Health and fitness promotion programs also decrease absenteeism among employees (Shephard, 1992). Baun, Bernacki and Tsai (1986) compared illness absenteeism rates, medical care utilization rates, and the costs of fitness programs between participants and nonparticipants employed at a large company. The participants involved in this study consisted of 296 nonexercisers, and 221 exercisers (Baun et al., 1986). The variables considered in this study were age, sex, and exercise (exercise recorded on the computer for one year) (Baun et al., 1986). Upon completion of their study, the investigators found that the nonexercisers had more sick days than the exercisers, and females both in the exercise and the nonexercise groups had a significantly larger number of sick days than the males in the corresponding groups (Baun et al., 1986). The researchers found that the participants in the nonexercise group had higher health care claim reimbursements than the participants in the exercise group (male nonexercisers $1,003.00 vs. male exercisers $561.00; female nonexercisers $1,535.00 vs. female exercisers $639.00). According to Baun et al. (1986), the average hospital claim for the individuals in the exercise group was $1,220.00, and $2,377.00 for the individuals in the nonexercise group (Baun et al., 1986). However, Baun et al. (1986) noted that the absenteeism rates remained the same both before and after the implementation of the wellness program, which led them to suggest that the differences between the exercisers and the nonexercisers may have been related as much to initial personality traits as to program implementation.

Tsai et al. (1987) examined the relationship between employee turnover and participation in a corporate fitness program. Participants in this investigation classified themselves as either exercisers or nonexercisers (Tsai et al., 1987). In January of 1982, a

health and fitness program was implemented in the Tenneco Corporation. This health and fitness program consisted of aerobics, weight training and calisthenic classes (Tsai et al., 1987). The participants selected for this study included those employees who were hired between January 1978 and December 1981, and January 1982 and December 1985 (Tsai et al., 1987). The participants were considered either exercisers or nonexercisers. At the conclusion of this study, the investigators found that participants who classified themselves as exercisers had been employed longer at the company than those who did not exercise (Tsai et al., 1987). Tsai et al. (1987) suggested that participation in an exercise program could possibly have a long-term effect in reducing employee turnover.

Shephard (1992) also noted a reduction of employee turnover as a potentially important dividend of an employee fitness program. Similar to Shephard (1992), Donoghue (1977) reviewed research related to employee health promotion programs and absenteeism, and suggested that many investigators had found that physical activity had a positive effect on work performance and absenteeism.

Summary

Based on the above related literature, it is evident that worksite health promotion programs can benefit the employee as well as the employer. Worksite health promotion programs can help to improve employees' attitudes and behaviours toward physical fitness and well being, thus motivating them to lead a more positive healthy lifestyle. In terms of workplace health promotion programs benefiting the employer, these health promotion programs can decrease absenteeism, decrease health care costs, increase productivity, and improve employees' attitudes toward their job (Shephard, 1989; Shephard, 1991). According to Baun et al. (1986), employee health and wellness programs may also help facilitate the recruitment of healthier employees who have positive lifestyle behaviours and a more positive attitude toward work.

Posyniak and Kummerfield (1992) suggested five goals that employee workplace health promotion programs strive to achieve: 1) improve the health of their employees, 2) encourage/motivate their employees through education to lead healthier lifestyles, 3) decrease absenteeism, 4) decrease employee health and injury costs, and 5) create an overall healthy environment.

Implication of this Study on Education

This research project focused on working with an adult population. The participants in this study not only participated as learners, they also played a key role in divising the health education sessions. The participants in the health counselling group helped determine what health-related issues were discussed throughout the course of the three month study period. Encouraging the employees to participate in the development of this wellness program, might have led them to be more internally motivated to comply with the program.

At the end of the three-month test period, the participants were asked for their input as to how they felt the program ran, what improvements could have been made, and what areas of health education they would have liked to explore more. Such research is important to adults in education in the workplace because it helped develop an understanding as to how adult learners learn best, and what education tools work best when dealing with an adult population.

CHAPTER THREE: METHODOLOGY

Proposed Sampling Methods

The participants in this study were drawn from a major corporation in the Niagara Region. The volunteer subjects, drawn from a large modern office building, were assigned to one of three conditions: i) CSTF (Canadian Standardized Test of Fitness) & health counselling, ii) CSTF only, and iii) a control group; measures of all test variables were repeated after intervals of one week and twelve weeks. Measures of attitudes, beliefs, social norms, behavioral intentions to comply, behaviours and barriers established that the findings were generalizable to the Canadian population. Matching variables were included as covariates in the final analyses. The sample population for this study was not chosen randomly because some participants volunteered for this study only if they were selected to be in either Group 2 (CSTF only) or Group 3 (control), where there was very little physical participation required. Therefore, in order to ensure that there was enough participants in this study, the participants were able to self-select which group they preferred to be in.

Description of the Sample

This research study consisted of 83 participants (44 males and 39 females) employed at a large corporation in the Niagara Region. The participants were middle managers ranging in age from 20 to 45 years. The sample may be considered as "white collar" workers, all having completed a level of post secondary certification. The group were responsible for developmental projects in the areas of information technology for the corporation. The sample were salaried and as such their work day may have extended beyond the traditional 9 to 5 time span.

The participants were divided into three groups: Group 1: CSTF with health counselling (11 males, 18 females); Group 2 CSTF (17 males, 11 females); and Group 3: Control (questionnaire) (16 males, 10 females). Although the starting sample was n=83,

the final sample consisted of n=46. This study was completed in three months. There was a noted decrease in the number of participants who attended the follow-up test sessions: Group 1 (7 males, 16 females); Group 2 (9 males, 5 females); and Group 3 (4 males, 5 females). The ratio of the second questionnaire received back from the three groups was: Group 1 (7 males, 16 females); Group 2 (9 males, 5 females); and Group 3(4 males, 5 females).

Sample Size Calculations

$n \geq 2(s^2) \times (2\text{beta} + 2\text{alpha})^2$ (expected mean x % change)

where s^2 =variance for expected mean scores.

Percent change refers to effect size, the range within which our observed expected mean should fall.

Zbeta for 80% power calculations = 0.84

Zalpha for alpha=0.05 is 1.96

From the practical viewpoint, a 10% increase in the intention to engage in active living would be a useful outcome, as would a 10% gain in fitness. Preliminary tests (Godin, Cox & Shephard, 1983) showed that the variance in behavioural intentions was 10%, and a change of the required order could thus be detected with a sample of N=108 (alpha = 0.05). Expected means for the measure "intention to exercise" were based on Godin, Cox, and Shephard (1983), considering pre-test expected means (± s) of 1.91 ± 1.30 and post-test expected means (± s) of 2.27 ± (1.1), we would expect a mean score of 2.09 ± (1.2) for the intentions to exercise.

$$\text{Formula: } \frac{2 \times (1.2)^2 \times (0.84 + 1.96)^2}{2.09 \times 0.10} = 108 \text{ subjects}$$

Therefore, the estimated sample size for this research study, considering costs and time related to the treatments and measurements was a total sample of N=108, which was subdivided into three groups of 36 subjects per group. Although the estimated sample size for this research study was 108 individuals, because the researcher was relying on

volunteers from this corporation, only 83 individuals volunteered for this study, therefore the sample size for this study was 83.

The sample size for this research study was based on an estimated statistical power of 80% and an alpha coefficient of 0.05. The participants in this study were informed of this research study through inter-office mail. A middle manager within the company elected one employee to be a liaison between the participants and the researcher. Those individuals who were interested in participating in this study contacted the liaison and informed her of their interest in the study.

Instrumentation

In addition to collecting demographic information, the following pencil and paper tests were included:

1) Fishbein and Ajzen Attitude and Behaviour Questionnaire
(Godin, Cox, & Shephard, 1983).

2) Leisure Behaviour Questionnaire
(Montelpare & Kanters, 1994).

3) Ten Centimeter Bipolar Health Continuum
(Marshall, Montelpare, Proctor, & Verkerk, 1990).

4) Neugarten Life Satisfaction Assessment
(Shephard, Montelpare, Berridge, & Flowers, 1986).

5) Job Description Index
(Shephard, Montelpare, Berridge, & Flowers, 1986).

6) Selected questions from the Ontario Health Survey
(Montelpare, Yardley & Kanters, 1993).

7) Symptom Reporting Questionnaire
(Montelpare & Kanters, 1994).

The references assigned to each questionnaire indicated the study in which these instruments were used by the principal investigators (Questionnaire available upon request).

Procedure For Data Collection

The participants were divided into three sub-groups: (i) CSTF & health counselling, (ii) CSTF only, and (iii) a control group. All tests described in the CSTF manual were used. As well, blood cholesterol level was measured.

- All three groups involved in the experiment completed a pencil paper test.
- Once the questionnaires were returned, participants in Group 1 and Group 2 received fitness testing.
- Through weeks three to eleven, Group 2 received weekly health counselling sessions of one hour duration, as detailed in Table 1.
- During week twelve all three groups completed a final questionnaire. Participants in Group 1 and Group 2 completed fitness testing, (see Table 2 for an outline of the three month period).

Research Design

The study was organized as a split plot factorial 2 x 3 design, with "3" referring to the three treatment groups: i) CSTF & health counselling, ii) CSTF only, and iii) a control group; and "2" referring to the two testing days, as illustrated in Table 3.

Procedures

All participants were given a questionnaire to complete on their own time prior to taking part in the fitness testing. Once all the questionnaires had been returned, the individuals in this study then participated in fitness evaluations. The participants in this study were employed at two separate buildings. The first fitness testing evaluation took place in one day. The participants from the first building were tested in the morning, and the participants from the second building were tested in the afternoon. All aspects of the fitness testing took approximately one hour. Approximately 10 individuals were tested in one hour. The participants were notified of their test time through inter-office mail,

however if this test time was not suitable to their working schedule, they were permitted to arrive at the test time which best suited them. The same procedures were repeated for the second fitness testing session after the three-month time period.

Table 1

Weekly Schedule for Health Counselling

Week	Health Counselling
Week 3	"A definition of Active Living"
Week 4	"Exercise and Training"
Week 5	"Feedback and discussion relating to the participants fitness results"
Week 6	"Video: The Ticker Test"
Week 7	"Smoking and Hazards Associated with Second Hand Smoke"
Week 8	"Body Fat, Computing Calories, and Cholesterol"
Week 9	"Facts and Myths about Exercise"
Week 10	"The Do's and Don'ts of Exercise"
Week 11	"Measuring Your Stress and Coping Skills; Wellness program"
Week 12	Assessment

Table 2

Outline of Test Groups and Time-Plan

Week 1 TEST #1	Weeks 3 to 11	Week 12 TEST #2
GROUP 1 CSTF and health Screening with Questionnaire	Health Counselling	CSTF and health screening with Questionnaire
GROUP 2 CSTF and health Screening with Questionnaire		CSTF and health screening with Questionnaire
GROUP 3 Control with Questionnaire		Control with Questionnaire

Table 3

Workplan and Timeline

Workplan

Time Line and Feasibility of the Study

June 5	(week 1)	Will meet with the middle managers involved in the study and discuss the purpose of the study as well as how the study will be conducted. Questionnaires will be distributed to all participants involved in the study.
June 12	(week 2)	During this week, participants in Group 1 and Group 2 will complete all aspects of fitness testing (CSTF, cholesterol, height, weight, and skinfold testing). They will complete a PAR Q test as well.
June 19	(week 3)	Participants in Group 1 will receive health counselling through weeks 3 to 11.
June 26	(week 4)	Health counselling.
July 3	(week 5)	Health counselling.
July 10	(week 6)	Health counselling.
July 17	(week 7)	Health counselling.
July 24	(week 8)	Health counselling.
July 31	(week 9)	Health counselling.
August 7	(week 10)	Health counselling.
August 14	(week 11)	This will be the last week of health counselling for participants in Group 1.
August 28	(week 12)	During this week, Group 1 and Group 2 will complete all aspects of fitness testing (CSTF, cholesterol, height, weight, and skinfold testing). All participants from Group 1, Group 2 and Group 3 will complete a final questionnaire.

Statistical Procedures

The data collected in this study were analyzed using SAS (Statistical Analysis System) on a Silicon graphics server at Brock University. The following variables were identified in this study:

• Dependent Variable: The measure of compliance toward a fitness and health counselling program.

• Independent variables include measures of attitudes and behaviours toward physical activity, and scores on the CSTF and health screening measures.

The following statistical procedures were conducted: Descriptive statistics (frequency, univariate), t-tests between groups, and ANOVA for all measurements.

Methods For Fitness Testing based on the Canadian Standardized Test of Fitness Measurement Techniques for Weight and Stature

Equipment required:

- scale
-tape measure
-sphygmomanometer
-Body Mass Index Chart

1. **Weight** (Jetté, 1984)

   Body weight should be measured with a beam or analog scale and recorded to the nearest 0.1 kilogram (kg). The person wears only light clothing (no shoes).

2. **Body Mass Index** (Sizer & Whitney, 1994)

   Body Mass Index (BMI) is a more sensitive indicator of body composition than weight. It indicates underweight or overweight and can determine the percentage of fat in a person's body by measuring a person's weight in relation to their height.

How to measure Body Mass Index (Sizer & Whitney, 1994):

$$\text{BMI} = \frac{\text{Body weight (in kilograms)}}{\text{Height 2 (in metres)}} \quad \text{OR} \quad \frac{\text{Body weight (in pounds)}}{\text{Height (in inches) 2}}$$

3. **Standing height** (Jetté, 1984)

The person stands upright in an erect position, arms hanging by the sides, feet together, heels in contact with the wall or other measuring device. The participant is instructed to stand as tall as possible and a gentle upward pressure is exerted on the mastoid processes as the person is asked to take a deep breath, and to look toward the horizon. A set square is placed on the head, depressing the hair to make firm contact, a mark is made at the level of the lower border of the square on the wall or other recording instrument. The distance from the floor to the mark is recorded.

Blood Pressure: Using a Sphygmomanometer

How to take an arm blood pressure reading:

1. Ask the subject to extend arm with hand supinated, and to open and close fist about ten times. Opening and closing the hands increases the gradient of pressure and volume between the blood vessels in the arm and forearm.
2. Apply cuff snugly, making sure that center of cuff bladder is over brachial artery. Korotkoff (Blood Pressure measurement sounds) sounds are loudest over the brachial artery.
3. Place diaphragm of stethoscope under cuff directly over brachial artery.
4. Inflate cuff as rapidly as possible to about 140 mm Hg with patient's arm at heart level. If Korotkoff sounds are present, pump cuff up another 20 mm Hg and repeat listening an pumping until no Korotkoff sounds are heard. Korotkoff sounds are produced by an abrupt distention of the arterial wall by blood pushing through to the distal artery under a constricting cuff.

Table 4

Body Mass Index Values for Men and Women

Men	Women	Risks
< 20.7	<19.1	Underweight. The lower the BMI, the greater the risk
20.7 - 26.4	19.1 - 25.8	Normal, very low risk
26.4 - 27.8	25.8 - 27.3	Marginally, overweight, some risk
27.8 - 31.1	27.3 - 32.2	Overweight, moderate risk
31.1 - 45.4	32.3 - 44.8	Severe overweight, high risk
> 45.4	>44.8	Morbid obesity, very high risk

5. If Korotkoff sounds are still very soft, raise patient's arm as high as possible and inflate cuff again; then lower arm and deflate cuff as usual.
6. Deflate cuff at rate of about 5 mmHg/sec until first Korotkoff sounds are heard. Read systolic pressure to nearest 5 mm Hg (e.g., 120, 125, 130). Measurements can not be considered accurate within 5 mm Hg because of moment-to-moment fluctuations in pressure and accuracy of the sphygmomanometer.
7. Listen for pulses alternans. A condition where a double beat is present often associated with heart damage or disorders.
8. Deflate cuff further until muffling is heard, then until Korotkoff sounds disappear. If difference in pressure between muffling and disappearance is less than 10 mm Hg report the latter as diastolic pressure (to nearest 5 mm Hg). If difference is greater than 10 mm Hg than report both muffling and disappearance pressures (e.g., 140/70/40). Diastolic pressure is likely just (approximately 10 mm Hg) below the last muffling sound as measured interarterially.
9. If arm is so large that cuff width is less than 40 percent of arm circumference, use thigh cuff. If no thigh cuff is available, use arm cuff above radial artery.

Canadian Aerobic Fitness Test (CAFT) (Canadian Association of Sport Sciences, 1987).

Purpose: To determine an individual's level of aerobic fitness. Specifically, the CAFT is a submaximal, prediction test for V02 Max. There are several sets of norms and comparison charts within the exercise science literature.

Equipment: 18" steps, CAFT cassette tape and a cassette recorder, or a metronome with a six beat per measure count (UP-UP-UP-DOWN-DOWN-DOWN), stethoscope, stopwatch.

Procedure:

1. Have the subject stand in front of the step bench with feet together.

2. Start the tape recorder so that the subject steps up and down the stairs.

3. Step 1 - place your right foot on the first step.

4. Step 2 - place your left foot on the second step.

5. Step 3 - place your right foot on the second step, so feet are together.

6. Step 4 - start down with your left foot to the first step.

7. Step 5 - place your right foot on ground level.

8. Step 6 - place your left foot down on ground level, so feet are together.

9. Continue stepping for three minutes, at which time you will be commanded to stop.

10. Start counting the pulse at the termination of the command word "COUNT" and continue counting until the first sound of the command word "STOP."

11. Quickly ascertain whether the participant is to continue or stop the test. The participant does not continue if the heart rate is equal to or exceeds the ceiling post-exercise heart rate. If there are no contraindications, have the participant complete the second session.

12. Repeat the post-exercise heart rate measurement. Determine if the participant is to continue for a third session. The participant may complete a maximum of three stepping sessions. (see Table 5).

Predicted V02 Max (ml/kg/min) can be determined from the following equation:

42.5 + {16.6 (energy requirements)} - {0.12 (Weight)} - {0.12 (Heart rate on last stage)} - {0.24 (Age)}

Determination of Desirable Body Weight

The BMI uses the metric system, so you need to determine your weight in kilograms and your height in meters. The formula is:

$$\frac{\text{Body weight in kilograms}}{(\text{Height in meters})^2}$$

Dividing your body weight in pounds by 2.2 will give you your weight in kilograms. Multiplying your height in inches by 0.0254 will give you your height in meters.

$$\text{Your weight in kilograms} = \frac{\text{(Your weight in pounds)}}{2.2} =$$

$$\text{Your height in meters} = \text{(Your height in inches)} \times 0.0254 =$$

$$\text{BMI} = \frac{\text{Body weight in kilograms}}{(\text{Height in meters})^2} =$$

A BMI range of 20 to 25 is considered to be normal, but a suggested desirable range for females is 21.3 to 22.1 and for males is 21.9 to 22.4. The BMI values above 27.8 for men and 27.3 for women have been associated with increased incidence rates for several health problems, including high blood pressure and diabetes. The American Dietetic Association, in their position statement on nutrition and physical fitness, notes that a BMI greater than 30 is classified as obese.

If you want to lower your body weight to a more desirable BMI, such as 22, use the following formula to determine what that weight should be; the weight is expressed in kilograms, so multiplying it by 2.2 will give you the desired weight in pounds.

Kilograms body weight = Desired BMI x $(\text{Height in meters})^2$.

The following is an example for a woman who weighs 187 pounds and is 5'9" tall: her BMI calculates to be 27.7, so her weight poses a health risk. If she wants to achieve a BMI of 23, she will need to reduce her weight to 155 pounds.

Kilograms body weight = 23 x (1.753)2 = 70.6
70.6 KG x 2.2 = 155 pounds

Kilograms body weight = (Your desired BMI) x $(\text{Your height in meters})^2$

Kilograms body weight = x
Kg x 2.2 = pounds

Table 5

Post Exercise Heart Rate Levels

CEILING POST-EXERCISE HEART RATES (based on a 10 second pulse count):

AGE	AFTER 1st SESSION	AFTER 2nd SESSION
60-69	24	-
50-59	25	23
40-49	26	24
30-39	28	25
20-29	29	26
15-19	30	27

* you must refrain from exercise if you reach these ceilings within the 10 second count taken after completing the exercise stage.

Table 6

Energy Requirements in Litres of Oxygen per Minute of Different Stages of the CAFT

STAGE	MALES	FEMALES
1	1.1391	0.9390
2	1.3466	1.0484
3	1.6250	1.3213
4	1.8255	1.4925
5	2.0066	1.6267
6	2.3453	1.7869
7	2.7657	-

Determination of Percentage Body Fat

According to Hockey (1993), the best way to determine body fat percentages is through the technique of underwater weighing. However, this technique may be too cumbersome and expensive to be considered practical. A simpler, and less costly way to determine body fat percentage may be through skinfold measurements.

Yet, the first rule about skinfold testing is that it requires practice to obtain consistent results. Some considerations which can ensure the accuracy of skinfold testing include:

- Firmly grasp the fold of the skin between the left thumb and forefinger, and pull the fold away from the body.
- Place the contact surfaces of the calipers approximately one-half inch from the tips of the fingers.
- The caliper should be held perpendicular to the skinfold by the right hand, with the skinfold dial up so that it can be read.
- Wait for approximately 2 seconds until the needle becomes relatively stable.
- Read the measurement to the nearest 0.5 mm.
- Three measurements should be taken at each site, with at least two of these measurements being equal. If not, additional measurements should be made until consistency is obtained.
- All measurements should be made on the right side of the body.
- Marking each anatomical site with a felt pen will enhance consistency.
- Measurements should not be taken when the skin is moist or through leotards or tights.
- Measurements should not be taken immediately after exercise or when the subject is overheated because the shift in body fluid to the skin may increase the skinfold size.

Skinfold Sites

The following are descriptions of the locations for skinfold measurements:

1. Tricep skinfold- The triceps skinfold is measured on the back of the unclothed arm with the arm flexed at a right angle, a point midway between the tip of the olecranon and the acromion process is marked with a felt pen. With the arm hanging relaxed, the skinfold is raised on the triceps muscle one cm above the marked mid-arm point.
2. Subscapular skinfold-The subscapular skinfold is raised lateral to the inferior angle of the right scapula with the fold running downwards and outwards, in the same direction as the inner border of the scapula.
3. Supra-iliac (waist) skinfold-The skinfold is lifted on the right mid-axillary line just above the crest of the ilium. The fold is lifted to follow the natural diagonal line at this point (dorsally upward).
4. Chest skinfold-Take a diagonal fold on the front of the chest. For men, this should be mid way between the right nipple and the front border of the armpit. For women, this should be two thirds of the way from the right nipple to the front border of the armpit.
5. Thigh-Take a vertical fold on the front of the right thigh midway between the hip and knee joints. NOTE: it is often easier to take this measurement if the subject is seated with the knee slightly flexed, with weight not supported on that leg.
6. Abdominal-Take a vertical fold approximately 1 inch to the right of the umbilicus.
7. Midaxillary-The skinfold is lifted on the right mid-axillary line just above the crest of the ilium. The fold is lifted to follow the natural diagonal line at this point (dorsally upward). The calipers are again used about 1 cm from the point at which the skinfold is lifted.

Use the following "Generalized Equations" to compute body compositions:

Males use the following four sites: chest, midaxillary, abdominal, supra-iliac.

The equations to calculate percentage of body fat for males is:

Percent body fat= 0.27784(sum of four skinfolds) - 0.00053(sum of four skinfolds)^2 + 0.12437(age) - 3.28791

Females use the following five sites: thigh, triceps, abdominal, supra-iliac, subscapular.

The equation for calculating percentage of body fat is:

Percent body fat= 0.29731(sum of five skinfolds) - 0.00053(sum of five skinfolds)^2 + 0.03037(age) - 0.63054

Blood Cholesterol Measurements on the Reflotron

Step-by-step procedures for the quantitative determination of cholesterol, with the Reflotron

1. The researcher will wipe the finger to be punctured with an alcohol swab.
2. The subject will then enter the laboratory and sit at the designated testing table; the door of the laboratory will be closed.
3. The researcher will then explain all components of the testing procedure to the subject.
4. Before performing the test, the researcher will switch on the Reflotron to warm it up.
5. The researcher will then put on latex gloves so as not to contaminate any of the testing instruments.
6. The researcher will wear a new pair of gloves for each subject.
7. The researcher will insert a sterile lancet into the Autoclix mechanism and a sterile capillary tube into the pipette.

8. When "READY" appears on the display, the researcher will take a reagent carrier strip out of the vial.

9. The researcher will then close the vial immediately with the stopper.

10. The researcher will remove the foil protecting the test area, taking care not to overbend the strip

11. Using the Autoclix mechanism, the researcher will puncture the subject's finger.

12. Using the Reflotron pipette, the researcher will draw up the blood from the subject's finger avoiding the inclusion of air into the pipette, and apply a drop directly to the center of the red test zone by pushing on the plunger without allowing the pipette tip to touch the zone.

13. Within 15 seconds the researcher will open the flap on the Reflotron and place the strip on the guide and insert the strip horizontally into the Reflotron until a click is heard; the researcher will then close the flap.

14. The display "CHOL" (for cholesterol testing) confirms that the test-specific magnetic code has been correctly read into the Reflotron.

15. The subject and researcher must then wait 176 seconds for the results to appear measured in mmol/l.

16. The researcher will then dispose of the pipette capillary tube and the lancet into the appropriate refuse bin.

17. The bin will then be passed to Melodie Shick-Porter (school nurse) who will have the bin disposed of through the appropriate disposal system.

Scoring Technique for the Questionnaire

Life Satisfaction Assessment

The respondent's general perspective of life satisfaction was measured through the Life Satisfaction Assessment (LSA) questionnaire. The LSA used general statements about life, such as: "As I grow older, things seem better than I thought they would be."

Individuals responded to each statement by selecting either "Agree," "Disagree," or a "?" if they were unsure about their response to the statement. If the statement were true and the individual responded with agree, then the statement was scored as +1, however, if the individual responded with disagree, then the item was scored as -1. If the response to the statement were "?," then the item was scored as "0". Similarly, if the statement were false and the individual's response were disagree, then the item was scored as +1, or if the individual's response to a false statement were agree, then the item was scored as -1. If the response to the statement were "?," then the item was scored as 0.

Scores on the LSA ranged from -20 to +20. An individual received a positive score if his/her response supported a positive attitude, even though the statement was presented from a negative context. For example, if an individual disagreed with the statement "I feel old and somewhat tired," then his/her response would be viewed as a support for a positive attitude, and his/her score would be +1. Conversely, if an individual agreed with the statement "I feel old and somewhat tired," then the response would be viewed as supporting a negative attitude and his/her score would be -1.

Job Description Index

The Job Description Index questionnaire (JDI) measured the respondent's general perspective on his/her job. The JDI has five separate sections: Work on present job; Present pay; Opportunities for promotion; Supervision on present job; and People on your present job. Depending on the section of the JDI, the participants were required to respond to key words, such as in relation to the participants' present work, what was it like most of the time: "Gives sense of accomplishment," or "Fascinating." Individuals responded to each statement by selecting either "Y" for yes, "N" for no, or a "?" if they were unsure about their response to the statement. If the statement were positive and the individual responded with "Y", then the statement was scored as +1"; however if the individual responded with "N", then the item was scored as "-1". If the response to the

statement were "?", then the item was scored as "0". Similarly, if the statement were false and the individual's response were "N", then the item was scored as +1, or if the individual's response to a false statement were "Y," then the item was scored as -1. If the response to the statement were "?," then the item was scored as 0.

In the first section of the JDI (1) "Work on Present Job," the participants had to respond to key words based on the following statement: "Think of your present work, what is it like most of the time?" This section consisted of 18 responses; therefore, the scores could range from -18 to +18. In the second section of the JDI, (2) "Present Pay," the participants had to respond to key words based on the following statement: "Think of the pay you get now. How well does each of the following words describe your present pay?" In this section there were 8 different responses; therefore, the scores ranged from -8 to +8. The third section of the JDI, (3) "Opportunities For Promotion," required the participants to respond to key words based on the following statement: "Think of the opportunities for promotion you have now. How well does each of the following words describe these?" In this section there were 9 different responses; therefore, the scores ranged from -9 to +9. In the fourth section of the JDI, (4) "Supervision on Present Job," the participants had to respond to key words based on the following statement: "Think of the kind of supervision you get on your job. How well does each of the following words describe this supervision?" In this section there were 18 different responses; therefore, the scores ranged from -18 to +18. In the fifth section of the JDI, (5) "People On Your Present Job," the participants had to respond to key words based on the following statement: "Think of the majority of the people that you work with now or the people you meet in connection with your work. How well does each of the following words describe these people?" In this section there were 18 different responses; therefore, the scores ranged from -18 to +18.

Fishbein Questionnaire Assessing Attitudes and Behaviours Toward Exercise

The Fishbein Questionnaire used in this study was developed from the original questionnaire proposed by Ajzen and Fishbein (1980). This questionnaire was made up of Items for the Fishbein questionnaire, and was developed by Godin (1985). Each of these items and descriptive statistics related to the responses are presented in Tables 7 to 42. The items were defined as follows: i) attitude towards the behaviour (att); ii) subjective norm (sn); iii) behavioural beliefs (bb); iv) motivation to comply (mc). The specific interaction computations between questions are based on the presentation of Godin (1985).

10-Centimeter Bi-Polar Health Continuum

The questionnaire included a 10-centimeter (cm) bi-polar health continuum. The participants had to rate how healthy they felt they have been in the past month by placing an "x" on the 10-cm line. At one end of the continuum the rating was "extremely healthy," and at the other end the rating was "extremely unhealthy." If the participant's response measured 0 cm, then the individual felt he/she had been very healthy in the past month. However, if the participant's response measured 10 cm, the individual felt he/she had been very unhealthy in the past month. The results were broken down into segments of 2cm's: 0 to 2cm, 2.1 to 4cm, 4.1 to 6cm, 6.1 to 8cm, and 8.1 to 10cm.

Leisure Pursuits

The questionnaire also required the participants to list as many as six leisure pursuits during free time.

Strenuous, Moderate, and Mild Exercise

Based on a recent seven-day period, the participants were asked to give a numeric value for how many times on average they did certain kinds of physical activity for more than 15 minutes during their leisure time. The three different types of exercise were:

1) strenuous exercise causing the heart to beat rapidly (some of these activities included running, jogging, hockey, football, soccer, and squash);

2) moderate exercise, not exhausting (some of these activities included fast walking. baseball, tennis and easy bicycling);

3) mild exercise, minimal effort (some of these activities included yoga, archery bowling and golf).

Physical Activity during Youth

This section of the questionnaire required the participants to answer two questions:

1) Did you do any sport or vigorous physical activity during your free time when you were age 6 to 11 years?

2) Did you do any sport or vigorous physical activity during your free time when you were age 12 to 17 years?

There were three responses to both of these questions:

i) at least 3 times per week;
ii) 1 to 2 times per week;
iii) less than once per week.

Current Health Status

This section of the questionnaire dealt with the participants' current health status. There were seven health-related questions pertaining to leisure activities, pain relievers, doctor advice, blood pressure and health satisfaction.

The Symptom-Reporting Questionnaire

The Symptom-Reporting Questionnaire consisted of 24 common symptoms and sensations (see appendix B). The participants were asked to check how often they had detected the symptom in the past three months. A total symptom reporting score was created.

CHAPTER FOUR: RESULTS

A sample of the physical measures for the participants prior to the intervention of the study can be found in Appendix D (Tables 7 through 18).

Results for the Physical Fitness Measures

Descriptive statistics for the 10 physical fitness measures are presented in Tables 7 to 18. The data were separated by group and test session. No significant difference was observed in Analysis #1 for the pre-test versus post-test comparisons of BMI Diff, SYS Diff, DIA Diff, RHR Diff, CHOL Diff, FAT Diff, PUSH Diff, SIT Diff, and FLEX Diff within each group. Likewise, no significant difference was observed in Analysis #2, that is Group 1 versus Group 2 comparisons for Pre-test and Post-test difference scores. However, there was a significant difference in the pre-test versus post-test scores for handgrip, but only in Group 1. This significant pre-test versus post-test difference observed in Group 1 was not significantly different than the pre-test versus post-test difference in Group 2.

The analysis of variance (ANOVA) was used to measure the significant difference for the mean scores in the following set of physical assessment variables: diastolic blood pressure, systolic blood pressure, resting heart rate, body mass index, body fat, flexibility, handgrip strength, push ups, sit ups, cholesterol, and VO_2.

The independent variables used in the analysis of variance procedures for this set of dependent measures were gender (m, f), group (received fitness testing and health education, fitness testing), and test day (pre, post).

The following results were observed for each physical measure:

Diastolic Blood Pressure

The main effects ANOVA showed a significant F value of 2.62, d.f.=1, 83, p>0.02. Additional simple main effect analyses showed a significant F value between males and females, with males being significantly different, F=1.95, d.f.=1, 83; p>0.001. While no other significant simple main effects were observed (i.e., p>0.05), an F value of 2.88, d.f.=1, 83; p>0.09 was observed for individuals in Group 1 vs. Group 2, and, similarly, an F value of 3.08, d.f.=1, 83; p>0.08 was observed for the interaction term Sex by Group. No significant differences were observed for any simple main effects of the test times (pre- vs. post-).

Systolic Blood Pressure

The main effects ANOVA showed a significant F value of 4.5, d.f.=1, 83, p>0.001. Additional simple main effect analyses showed a significant F value between males and females, with an F value of 16.28, d.f.=1, 83, p>0.001; a significant F value was observed between Group 1 and Group 2, with an F value of 6.27, d.f.=1, 83, p>0.02; and a significant F value was found between Sex by Group, with an F value of 7.62, d.f.=1, 83, p>0.001.

Resting Heart Rate

There were no significant differences observed in the resting heart rates of the individuals involved in this study.

Body Mass Index

The main effects ANOVA showed a significant F value of 3.69, d.f.=1, 83; p>0.002. In addition, a significant F value was observed between males and females, F=10.04, d.f.=1, 83, p>0.002; and a significant F value was observed between Group 1 and Group 2, with an F value of 12.03, d.f.=1, 83, p>0.0008.

Body Fat

There was no significant main effect observed for body fat. However, there was a significant simple main effect in the average fat scores in individuals in Group 1 and Group 2, with an F value of 6.54, d.f.=1, 83, p>0.02.

Flexibility

There was no significant main effect observed for flexibility. However, there was a significant simple main effect between males and females, F value of 9.89, d.f.=1, 83, p>0.01.

Handgrip

The main effects ANOVA showed a significant F value of 15.9, d.f.=1, 83, p>0.001. Likewise, a significant simple main effect between males and females showed an F value of 88.95, d.f.=1, 83, p>0.001. Group simple main effect was also observed with an F value of 3.24, d.f.=1, 83, p>0.008; and a significant interaction between Sex by Group was observed, with an F value of 4.23, d.f.=1, 83, p>0.05.

Push Ups

There were no significant differences observed in the push up result of the individuals involved in this study.

Sit Ups

There was no significant main effect observed for sit ups. However, a significant simple main effect comparison showed a significant interaction term for Sex by Group with an F value of 4.25, d.f.=1, 83, p>0.05.

Cholesterol

There was no significant main effect observed for cholesterol. However, there was a significant difference in the average cholesterol scores between males and females with an F value of 4.79, d.f.=1, 83, p>0.03.

$V0_2$

The main effects ANOVA showed a significant F value of 3.45, d.f.=1, 83, p>0.03. Likewise, a significant simple main effect between males and females showed an F value of 10.19, d.f.=1, 83, p>0.003. Group simple main effect was also observed with an F value of 11.48, d.f.=1, 83, p>0.002.

The average scores for systolic blood pressure were similar between the two groups and within the expected range of 120 mmHg. Likewise, the average scores for diastolic blood pressure were not significantly different between the two groups, and these were also within the normal range of 80 mmHg. There was no significant difference between the average scores of Resting Heart Rate within the two groups and between the two groups. The Body Mass Index average scores for both groups were similar between the two groups. The average scores for cholesterol were also similar between the two groups. When examining the average scores for push ups, it was evident that there was no significant difference both within the two groups and between the two groups. There was very little difference between the average scores for sit ups. The average scores for flexibility were similar between the two groups and within the two groups. There was a significant difference in the pre-test (39.3) versus post-test (35.6) scores for handgrip, but only in Group 1. This significant pre-test versus post-test observed in Group 1 was not significantly different than the pre-test versus post-test difference in Group 1. There was no significant difference between the average scores for V02 both within the two groups and between the two groups

Results from the questionnaire

The results of the LSA scores are presented in Table 19 . The average LSA score for the CSTF/Health Education Group 1 was 8, while the average LSA scores for the Fitness Test Only Group 2 and the Control Group 3 were 7.9, and 7.3. The LSA scores

Table 19

Life Satisfaction Assessment Results

		Pre-Intervention	Post-Intervention
Group 1	x	8	8.9
	±S	5.1	9.2
	min	1	-15
LSTOT	med	7	10
	max	17	18
	mode	2	10
	N	28	18

		Pre-Intervention	Post-Intervention
Group 2	x	7.9	11
	±S	6.4	4.8
	min	-4	4
LSTOT	med	8	11.5
	max	18	17
	mode	13	16
	N	27	18

		Pre-Intervention	Post-Intervention
Group 3	x	7.3	7.4
	±S	7.1	7.1
	min	-7	-8
LSTOT	med	10	10
	max	18	15
	mode	10	-8
	N	24	11

had a possible scale range of -20 to +20; however, the most frequently reported score in Group 1 was = 2, in Group 2 was =6, and in Group 3 was =10. Average LSA total scores were compared between the three groups on the pre- and post-tests using a three-way analysis of variance procedure. The results presented in Table 19 indicate that there was no significant difference between males and females, or between members of the three groups, or between the two data collection periods.

The results for five sections of the JDI can be seen in Table 20 to 25 (Appendix E). In the first section of the JDI (1) the average score for Group 1 was 6.4, while Group 2 had a score of 6.4 and Group 3 had a score of 6.8. The most frequent score for Group 1 was 4, for Group 2 was 9 and for Group 3 was 6 (See Table 20). Average scores were compared between the three groups on the pre-and post-tests using a three-way analysis of variance procedure with interaction. The results indicated that while an overall main effect was not significant, there was a significant difference in the JDI (1) Work on Present Job score between males and females ($f=7.52$, $p<0.0073$).

In the second section of the JDI (2) the average score for Group 1 was -0.5, Group 2 had a score of 1.1 and Group 3 had a score of 0.5. The most frequent score for each group was 0, -2 and 0 respectively. Average scores were compared between the three groups on the pre-and post-tests using a two-way analysis of variance procedure. The results presented in Table 21 indicate that there was no significant difference between males and females, between members of the three groups, or between the two data collection periods.

In the third section of the JDI (3) the average score for Group 1 was 1.7, Group 2 had a score of 3.0 and Group 3 had a score of 0.6 (See Table 22). The most frequent score for Group 1 was 9, Group 2 was 9 and Group 1 was -5. Average scores were compared between the three groups on the pre-and post-tests using a two-way analysis of variance procedure. The results indicated that while an overall main effect was not

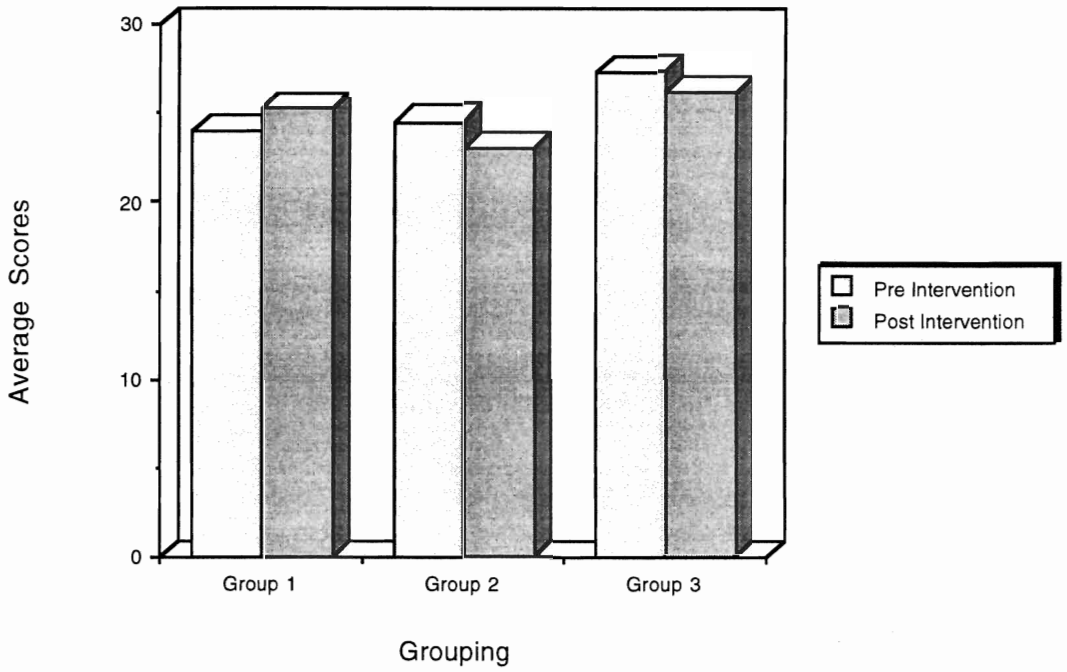
significant, there was a significant difference in the JDI (3) Opportunities for Promotion score between males and females ($f=3.68$, $p<0.0583$).

In the fourth section of the JDI (4) the average score for Group 1 was 12.5, Group 2 had a score of 13.9 and Group 3 had a score of 13.7. The most frequent score for each group was 15, 17, 17 respectively. Average scores were compared between the three groups on the pre-and post-tests using a two-way analysis of variance procedure. The results presented in Table 23 indicated that there was no significant difference between males and females, between members of the three groups, or between the two data collection periods.

In the fifth section of the JDI (5) the average score for Group 1 was 12.1, Group 2 had a score of 12.4 and Group 3 had a score of 13.5. The most frequent score for Group 1 was 12, Group 2 was 16, and Group 3 was 16. Average scores were compared between the three groups on the pre-and post-tests using a two-way analysis of variance procedure. The results presented in Table 24 indicated that there was no significant difference between males and females, between members of the three groups, or between the two data collection periods.

The following significant findings were observed for the sub-scales in the Fishbein Questionnaire (See Tables 25 to 53, Appendix E). There was a significant difference in the Subjective Norm (SN) between males and females (Graph figure 1). However, there was no significant difference observed for the dependent variable Attitude Towards the Behaviour (ATT). Although the interaction comparison for sex by group by questionnaire was not significant at $p<0.05$, the F value of 2.83 with a probability of 0.06 for the interaction comparison indicated that a difference existed between this set of means for the sub-scale Behavioral Beliefs (BB). There was no significant difference observed for the dependent variable Motivation to Comply (MC). The tabular results for repsonses to the Jod Ddescription Index and the Fishbein Questionnaire are presented in Appendix E.

Figure 1. Fishbein and Azjen Questionnaire: Subjective Norm



The results of the 10-Centimeter Bi-Polar Health Continuum suggest that no participants in Group 1 or Group 2 felt they were extremely healthy, while 7% of the participants in Group 3 felt they were extremely healthy. If you split the continuum in half, of Group 1, 67% felt they were healthy and 33% felt they were unhealthy; of Group 2, 65% felt they were healthy, and 45% felt they were unhealthy; of Group 3, 60% felt they were healthy, and 40% felt they were unhealthy (See Table 54).

The top five leisure pursuits of Group 1 were walking, reading, cycling, soccer, and yard work. The top five leisure pursuits of Group 2 were golfing, reading, working out, walking and relaxing. The top five leisure pursuits of Group 3 were reading, spending time with the family, golfing, watching television, and socializing.

The results of the section of the questionnaire dealing with strenuous, moderate, and mild exercise indicated that 47% of Group 1, 42% of Group 2, and 56% of Group 3 participated in strenuous exercise 0 times per week. Forty-three percent of Group 1, 39% of Group 2, and 39% of Group 3 participated in strenuous exercise between 1 and 3 times per week. Ten percent of Group 1, 19% of Group 2, and 5% of Group 3, participated in strenuous exercise more than 3 times per week (Exercise graphs strenuous, moderate and mild refer to figure 2, Appendix).

The results dealing with moderate exercise showed that 17% of Group 1, 7% of Group 2, and 52% of Group 3 participated in moderate exercise 0 times per week. Sixty-seven percent of Group 1, 75 % of Group 2, and 28% of Group 3 participated in moderate exercise between 1 and 3 times per week. Sixteen percent of Group 1, 18% of Group 2, and 20 % of Group 3 participated in moderate exercise more than 3 times per week (See Appendix E).

The results dealing with mild exercise show that 10% of Group 1, 8% of Group 2 and 17% of Group 3 participated in mild exercise 0 times per week. Seventy-two percent of Group 1, 62 % of Group 2, and 78% of Group 3 participated in mild exercise between 1 and 3 times per week. Eighteen percent of Group 1, 30% of Group 2, and 5 % of

Group 3 participated in moderate exercise more than 3 times per week (See Appendix E).

Table 54

10-Centimeter Bi-Polar Health Continuum Results

	Group 1	Group 2	Group 3
Extremely Healthy			
0-2 cm	0	7	0
2.1 to 4 cm	39	23	28
4.1 to 6 cm	28	35	32
6.1 to 8 cm	19	20	24
8 to 10 cm	14	15	16
Extremely Unhealthy			

In the section of the questionnaire dealing with Physical Activity during Youth, it was found that seventy-two percent of Group 1, 71% of Group 2, and 81% of Group 3 suggested that they participated in sport or vigorous physical activity more than 3 times per week during their free time between the years of 6 and 11. Seventeen percent of Group 1, 7% of Group 2, and 15% of Group 3 suggested that they participated in sport or vigorous physical activity more than 1 to 2 times per week during their free time between the years of 6 and 11. Ten percent of Group 1, 22% of Group 2, and 4% of Group 3 suggested that they participated in sport or vigorous physical activity less than 1 time per week during their free time between the years of 6 and 11.

Seventy-six percent of Group 1, 75% of Group 2, and 81% of Group 3 suggested that they participated in sport or vigorous physical activity more than 3 times per week during their free time between the years of 12 and 17. Seventeen percent of Group 1, 14% of Group 2, and 15% of Group 3 suggested that they participated in sport or vigorous physical activity 1 to 2 times per week during their free time between the years of 12 and 17. Seven percent of Group 1, 10% of Group 2, and 4% of Group 3 suggested that they participated in sport or vigorous physical activity less than 1 time per week during their free time between the years of 12 and 17.

In evaluating the participants Current Health Status, when asked whether or not their involvement in leisure activity was limited because of their health, 37% of Group 1, 36% of Group 2 and 39% of Group 3 reported that it was limited because of their health. Sixty-three percent of Group 1, 64% of Group 2, and 62% of Group 3 reported that leisure activity was not limited because of their health.

When asked if they had taken any pain relievers in the last four weeks, 4% of Group 1, 9% of Group 2 and 40% of Group 3 reported that they had taken pain relievers in the last four weeks. Ninety-six percent of Group 1, 91% of Group 2, and 60% of Group 3 reported that they had not taken pain relievers in the last four weeks. Seven percent of Group 1, 0% of Group 2, and 0% of Group 3 reported that they had taken the

pain relievers on the advice of their doctor. As well, 5% of Group 2, and 7% of Group 3 reported that they had taken medicine for their heart or blood pressure in the past four weeks.

When asked, "In general, compared to other persons your age, would you say that your health is excellent, very good, good, fair, or poor?," 7% of Group 1, 18% of Group 2, and 0% of Group 3, reported that they felt their health was excellent. Zero percent of Group 1, 0% of Group 2, and 8% of Group 3, reported that they felt their health was poor

When asked, "How satisfied are you with your health: very satisfied, somewhat, not too satisfied, or not at all satisfied?," 17% of Group 1, 32% of Group 2, and 12% of Group 3 reported that they were very satisfied with their health. Zero percent of Group 1, 4% of Group 2, and 8% of Group 3 reported that they were not at all satisfied with their health.

When evaluating the symptom reporting section of the questionnaire, while no significant difference was found for the main effects, a significant simple main effect was observed for the sex by group interaction, with an F value of 3.60, d.f.=1, 83, and p.0.03.

Table 55

Symptom Reporting Quesitonnaire Total

		Pre-Intervention	Post-Intervention
Group 1	x	8.5	6.5
	±S	3.6	5.2
	min	3	1
SYMTOT	med	9	5.5
	max	17	18
	mode	10	2
	N	30	16

		Pre-Intervention	Post-Intervention
Group 2	x	7.3	6.6
	±S	4.7	4.6
	min	0	0
SYMTOT	med	6.5	6
	max	15	14
	mode	2	3
	N	28	9

		Pre-Intervention	Post-Intervention
Group 3	x	6.6	7.3
	±S	5.2	4.6
	min	0	0
SYMTOT	med	5	6.5
	max	24	15
	mode	4	6
	N	26	10

CHAPTER FIVE: DISCUSSION, CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS FOR FUTURE RESEARCH

Discussion

The primary purpose of this research study was to determine whether or not the use of a single day of Personal Wellness Evaluations would be meaningful enough to change the attitudes of participants toward adopting a healthier lifestyle, or if it was necessary to include regular planned health counselling along with the Personal Wellness Evaluations in order to observe changes in beliefs, attitudes and behaviours toward active living and the adoption of a healthier lifestyle. As stated earlier, Group 1 received fitness testing on Day One and three months later, and health education counselling once per week for three months; Group 2 received fitness testing on Day One and three months later; and Group 3 was designated as the group of control subjects. It was hypothesized that there would be no difference in responses to a generalized health questionnaire across the three groups; and there would be no differences in fitness test results between Group 1 and Group 2; on Day One and after three months.

The results of this study supported the hypothesis in that there was no difference found in the responses to a generalized health questionnaire across the three groups. Likewise there were no differences found in the fitness test results between Group 1 and Group 2 on Day One and after three months of health education. These results were found to be similar to the findings of Godin et al. (1983) who found that a wellness program using the Ajzen and Fishbein (1980) psycho-social model to determine the impact of physical fitness evaluation and counselling on beliefs, attitudes and intentions to exercise regularly had no effect on the participants' intentions to exercise.

Participant selection for this research study was not random, but on a voluntary basis. Although many participants volunteered for this study, some participants may have felt that their employer required participation. Had the majority of the participants

in this study felt a desire to participate in the research study, the results may have shown some significant differences across the three groups over the three-month test period. The employees who want to participate in a workplace wellness program have a personal interest in their health and well being. This personal interest is what most likely keeps these individuals motivated to comply with the program. These individuals have a desire to attain a healthier lifestyle, whether it be improving their cardiovascular fitness, losing weight, or learning about healthy diets.

While this project was a valuable exercise from the perspective of the development of a workplace wellness health education program, the empirical evaluation of the effectiveness of health education was hindered by the number of individuals lost to follow up. Individuals who did not participate in the second session of fitness testing, as well as those individuals who did not complete a final questionnaire, were dropped from further statistical analysis to avoid bias within the results due to incomplete data.

One could argue that lack of compliance was the single most important problem with this project. Lack of compliance prevented the researcher from evaluating not only the impact of a fitness testing session on the workers, but the lack of participants in the second session negatively influenced the researcher's ability to determine the effectiveness of weekly health education sessions within this sample of individuals. This supports Shephard (1985) who suggested that poor compliance is one of the main factors limiting the effectiveness of fitness programs in workplace wellness programs.

While there may be several resons for the low level of compliance, such as work presures, importane of the project, minimal impact of feedback; it can be suggested that those participants who did not complete the final stages of this research project may have been those employees who participated in this study because their employer wanted them to, and not because they were intrinsically motivated to comply with any fitness testing or health education. As stated earlier by Lavoto and Green (1990), when trying to maintain employee participation in an employee wellness program, the employees who stuck to the

program and continued to participate, were those employees who were committed to the program prior to entering the workplace wellness program.

There may have also been an underlying reason why several employees did not participate in this study, and why several of the participants did not complete the final stages of the fitness evaluation. Even though the company supported this research study, and felt it was of great importance to the organization, the company itself may have been one reason why several employees did not volunteer for this study, or why some participants did not follow through with the program to the end of the three months. Many employees may have wanted to participate in the program but felt they could not add this program to their present work load. These employees are responsible for a certain percentage of the companies productivity, and their job only allows them so much time to complete their work. Some individuals may have felt that they did not have enough time presently to complete the work they were responsible for, and adding even one hour weekly health education sessions to their work load, was asking too much of them. Even though they may have wanted to participate in this research study, they may have felt that they were required to put the needs of the company ahead of their own personal needs. If some of the employees who felt they could not participate in this study due to their work load had not felt pressure coming from within the company to complete their work, they may have been more likely to participate in the study.

While there were relatively few strong significant differences observed in this study, the results indicated that there were differences in selected responses to the questionnaire. In particular, questions about self-ratings of health showed differences. The results for the 10-Centimeter Bi-Polar Continuum showed that while 7% of the participants in the control group (Group 3) felt that they were extremely healthy, no participants in either the Health Education/Fitness Testing group (Group 1) and the Fitness testing only group (Group 2) felt that they were extremely healthy. These results are important because they illustrate the starting levels of the health of the employees.

This perspective of self-perceived health may have influenced the self-selection of individuals into the various groups in this study. That is, individuals in Group 3 who felt that they were extremely healthy chose to be in that group because they felt they did not need any health education or fitness testing. Those participants who felt they could improve their lifestyles chose to be in Group 1 or Group 2.

Likewise, in some cases there were significant differences between Group 1 and Group 2 on measures of physical fitness. The observed differences may be a result of the process of self-selection; those individuals who were interested in health education and improving their lifestyle chose to be in Group 1. At the beginning of the health counselling sessions, the participants in Group 1 were asked what their goals and objectives were for the health education sessions. Some of their responses were: to identify healthy lifestyles, to identify activities which have the greatest feedback (i.e., exercise and diet), to develop an exercise program including weight loss, to increase or decrease caloric expenditure, to identify motivators for exercise, and to gain a feeling of well being. Based on these goals and objectives, it can be suggested that these individuals were interested in improving their health; therefore, they chose to be in Group 1.

The employees were encouraged to be an important part in developing the health education sessions. At the beginning of the study, the participants were asked to acknowledge the health related issues which they were most interested in learning about. These issues were then discussed throughout the three-month study period. According to Epes (1994) acknowledging the interests of the participants is one way of maintaining participation throughout the workplace wellness program.

Those individuals who were only interested in knowing their physical fitness capabilities, but did not want to participate in the weekly one-hour health education sessions, chose to be in Group 2. Some individuals who felt they were unfit may have desired to be in Group 1 or Group 2, but chose to be in the control group in order to avoid

any embarrassment from the fitness testing (i.e., persons who were overweight may not have wanted to have their body mass index taken; smokers avoided any cardiovascular testing).

The lack of significant difference between groups and test for life satisfaction was not unexpected given the application of treatment used in this project. Although one group was told about health education, simple weekly one-hour health education sessions may not be sufficient to cause changes in perceived life satisfaction. It is therefore recommended that an actual daily program incorporating exercise and health education is necessary in order to see any positive change in the participants.

Another difference in selected responses to the questionnaire was observed when evaluating the level of physical activity of the participants. Within the entire study, as one may expect for a group of self-selected control subjects, it was found that fewer participants from Group 3 were involved in strenuous physical activity more than three times per week compared to the individuals from Group 1 and Group 2. Conversely, more individuals in Group 3 reported that they participated in physical activity more than three times per week, when they were between the ages of 6 and 11, and between the ages of 12 and 17.

Some individuals agreed to participate in this study only if they were required to do minimal, if any, physical activity. Therefore, these individuals self-selected to be in the control group (Group 3). This self selection into the control group would explain why some individuals were involved in sedentary leisure activities. This may also explain the exercise behaviours of the participants. Very few individuals in Group 3 participated in strenuous or moderate physical activity (See Appendix F). Individuals who were not interested in physical activity or health education, but wished to participate in this study, were less likely to participate in physical activity during their leisure time. Group 3 was not receiving any fitness testing or health counselling; therefore, no change was expected in their leisure pursuits.

When evaluating the responses for the Leisure Pursuits section of the questionnaire, it was observed that participants in the Health Education/Fitness Testing group (Group 1) and Fitness testing only group (Group 2) preferred to be involved in more active leisure pursuits than individuals in Group 3. Participants in Group 1 and Group 2 were involved in activities such as walking, reading, cycling, soccer, yard work, golfing, working out, and relaxing. Participants in Group 3 were involved in more sedentary leisure activities such as reading, spending time with the family, golfing, watching television, and socializing. It can be suggested that the individuals in Group 1 and Group 2 led more active lifestyles prior to the research project and were, therefore, more likely to choose to be in a group which required physical activity.

With respect to the use of medications, it is interesting to note that very few individuals in Group 1 and Group 2 reported the use of pain relievers in the last four weeks, almost half of Group 3 reported that they had taken pain relievers in the last four weeks. Once again, such a health behaviour may be characteristic of the group of individuals who designated themselves as controls.

The health education sessions were held at two different locations. At one location, a high ranking corporate manager volunteered for the study. The participation level of the individuals involved in this program was much higher for those individuals who were in the same building as the corporate manager. This may be due to the participants' feeling that they were required to participate, and that the manager would be aware that they were not attending the health education sessions.

The lack of significant findings for the interaction of group-by-test indicates that the health education sessions had no profound effect on the physiological responses. Rather, the sessions may have influenced some notions of fitness test results. In addition, the lack of significant findings across the independent variable test time suggests that no significant change occurred during the program.

One explanation for the lack of change in the variables in the health education group may have been the lack of intrinsic motivation from the participants. Although several individuals in Group 1 chose to be in that group, there were some people who were randomly selected to that group. These individuals may have been there because they felt they were required to participate, and not because they felt they had anything to be gained from their participation in this study. Even though these individuals came to the weekly health education sessions, they may not have put any effort into taking this study one step further by increasing their level of physical activity, or changing some of their unhealthy habits (e.g., smoking, poor dietary habits). Had these participants chosen to participate fully in this study, there may have been some positive changes in the variables measured. Although these individuals did not get involved directly in the program, they were made aware of the importance of the program.

Again the number of individuals lost to follow up may play an important role in the lack of change in the variable between test groups. Several individuals did not continue with the program to the end of the three-month period. Some reasons behind this drop out may be due to lack of interest, lack of motivation, or too much of a work load. Several of the participants in Group 1 were involved in seminars and meetings which their job required them to attend at the same time as the health education seminars were taking place. This is another example of how the company supported this study, but at the same time was requiring the employees to forgo the health education sessions to attend to matters relating to their job.

Another reason for the lack of change across the variables for Group 1 may have been the attitudes and the expectations of the participants at the beginning of the research study. Some individuals felt that after participating in this program they would lose weight, become more physically fit, or adopt a physical fitness program on their own. One individual who had a desire to lose weight was disappointed at the end of the program because she had not accomplished her goal. She stated that she began walking

with her husband and children on a regular basis but had not seen any positive change in her weight since she began the program. It is important to realize that even though she may not have lost weight, there were other positive gains achieved from her new active lifestyle. Aside from increasing her knowledge about health and wellness, this individual was able to stay physically active on a regular basis, and was also able to spend time with her family. It is important for the individuals in this program to realize there were many positive gains achieved from participating in this program aside from the specific goals they had when they entered the program. Several individuals in the Health Education/Fitness Testing group (Group 1) commented on how they had started to become more physically active and were encouraging members of their family to become active as well.

The lack of change in the physical measure may also be due to the lack of stimulus for the participants. Physical fitness measures were evaluated at the beginning of the three-month period, and at the end of the program, but nowhere throughout the wellness program was there any physical fitness offered to the participants. Had the individuals in the study participated in some type of physical activity throughout the three-month period, there may have been some changes in the physical measures of the participants.

Another factor which may explain the lack of change in the physical fitness measures of the participants is that these individuals were all healthy at the beginning of the study, therefore the expected change may have been presumptuous. We should not have assumed that we would make an impact on these healthy workers. This finding was also a factor in the negative findings of a study conducted by Godin et al. (1983) who suggested that their participants wee largely interested in exercise before starting the investigation. As well, Conrad (1987) found that employees who participated in workplace wellness program were initially healthier and were more concerned with physical fitness and health related issues.

Although the stimulus for this research study was acute and not sufficient to cause a long-term change, there was, however, enthusiasm from the participants, and the verbal feedback from the participants supports the need for a long-term program.

Conclusions

The results of this study suggest that a three-month workplace wellness program had no impact on the participants' attitudes and behaviours toward health and physical activity. Employees who participate in a workplace wellness program must be intrinsically motivated to comply with the program in order to receive the full benefits the program has to offer. A major problem with the present study was the number of individuals lost to follow up. Some participants in this study may not have had the internal motivation to comply with this study, or may have felt pressure coming from within the company to complete their workload within the normal working day, leaving no room for participation in a workplace wellness program. Several participants did not complete the second fitness testing session, the second questionnaire, or, in the case of Group 1, attend all health education sessions. For some individuals, the key to participating in a workplace wellness program may be being able to balance the needs of the company with their own personal needs. Employees who will benefit from a wellness program are those individuals who wish to learn more about their personal wellness and want to lead healthier lifestyles.

Recommendations

The general limitations associated with this research project were outlined in chapter one. One such limitation was that not all participants in Group 1 would attend all health education sessions. One method of correcting this problem would be to hold the health education sessions at different times, in order to allow those individuals with time constraints to attend the sessions. If the health education sessions were to continue for a longer time period (i.e., longer than three months), the employees would be able to attend

more sessions, and get a better understanding of health and well being. Likewise, the health education sessions for this research project were held during the summer months and therefore participants' holidays may have contributed to the low level of attendance at some of the health education sessions. A workplace wellness program that continued into the winter months would help determine how active the employees are throughout the entire calendar year, and not just the summer months, which are possibly the months where most individuals are active.

Another limitation to the study was that some participants may work to their full potential in the physical fitness testing. If a physical fitness program were implemented into the workplace wellness program, participants may become more interested and motivated to fully participate in the physical fitness testing.

Implications for Future Research

Based on the results of this study, the following recommendations are made for future research:

1. Employees involved in a workplace wellness program would benefit from a program which included a physical fitness component with the health education. This would give the employees an idea as to what activities would benefit them, as well as keep them physically active.

2. The duration of the workplace wellness program should be longer than three months. This would allow more time for educating the employees on health related issues, and it would allow the researchers to better determine if the wellness program had any significant difference on the health attitudes and behaviours toward physical activity.

3. If possible, a member of the research team should be available to the company to discuss with the employees any aspects of the health education sessions or the physical fitness program itself.

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Appendix A

Group Listing

Group One --Health Counseling and Fitness Evaluation

Name	Group	Name	Group	Name	Group
AG	gr1 01	EL	gr1 11	KE	gr1 21
DK	gr1 02	TF	gr1 12	KA	gr1 22
W	gr1 03	KC	gr1 13	LL	gr1 23
JB	gr1 04	LY	gr1 14	AD	gr1 24
LW	gr1 05	MP	gr1 15	SG	gr1 25
LO	gr1 06	M	gr1 16	DD	gr1 26
MM	gr1 07	PP	gr1 17	TA	gr1 27
RF	gr1 08	RV	gr1 18	PC	gr1 28
SA	gr1 09	TL	gr1 19	MB	gr1 29
SF	gr1 10	DL	gr1 20	DB	gr1 30

TOTAL = 30

Group One --Fitness Evaluation

Name	Group	Name	Group	Name	Group
AR	gr2 01	L	gr2 12	BF	gr2 22
FP	gr2 03	RW	gr2 13	CJ	gr2 24
MK	gr2 04	RB	gr2 14	MC	gr2 25
MF	gr2 05	TS	gr2 15	PM	gr2 26
PD	gr2 06	J	gr2 16	S	gr2 27
RB	gr2 07	TN	gr2 17	PD	gr2 28
RS	gr2 08	OB	gr2 18	DH	gr2 29
B	gr2 09	KG	gr2 19	MF	gr2 30
HG	gr2 10	PA	gr2 20		
KR	gr2 11	JL	gr2 21		

TOTAL = 28

Group One --Questionnaire

Name	Group	Name	Group	Name	Group
BM	gr3 01	CJ	gr3 10	NK	gr3 19
GM	gr3 02	DL	gr3 11	MH	gr3 20
JG	gr3 03	KN	gr3 12	BC	gr3 21
MS	gr3 04	HI	gr3 13	RB	gr3 22
MP	gr3 05	SS	gr3 14	S	gr3 23
D	gr3 06	DW	gr3 17	RM	gr3 28
RF	gr3 07	DC	gr3 16	WL	gr3 25
JM	gr3 08	A	gr3 17	LL	gr3 26
LH	gr3 09	PS	gr3 28		

TOTAL = 26

Appendix B

Data Collection Sheet

Data Collection Sheet

I.D. # _____

Gender (Please Circle): M F Date of Birth: ___ mm ____ dd___ yy

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Weight _____ (kg) Height ____ (cm)

Blood Pressure ___/___ mmHg Resting Heart Rate___/_____bts/min

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Cholesterol Reading mmol/l Glucose Reading_____mmol/l

Skinfold Testing Clothing_____

Males		Females	
Chest	_____	Thigh	_____
Midaxillary	_____	Tricep	_____
Abdominal	_____	Abdominal	_____
Supra-iliac	_____	Supra-iliac	_____
		Subscapular	_____

Push ups _____ Sit ups to Cadence _____

Flexibility Trial 1____, Trial 2____, Trial 3____ Avg=____

Grip Strength left Trial 1____, Trial 2____, Trial 3____ Avg=____
right Trial 1_, Trial 2____, Trial 3____ Avg=____

Canadian Aerobic Fitness Test

Heart Rate After Session #1_____

Heart Rate After Session #2_____

Heart Rate After session #3 _____

5-minute Post Exercise Heart Rate _____

Appendix C

Coding For Leisure Pursuits Question Found in the Questionnaire

Coding for leisure pursuits question on the questionnaire.

01 housework
02 shopping
03 sleep
04 play with children
05 spend time with spouse
06 fish
07 hunt
08 walks
09 folk dancing
10 golf
11 read
12 computer time
13 basketball
14 watch tv
15 crafts
16 night course
17 socialize
18 soccer
19 cycle
20 yard work
21 relax
22 volleyball
23 puzzles
24 baseball
25 listen to music
26 tennis
27 ski
28 workout
29 running
30 travel
31 exercise
32 hockey
33 nothing
34 photography
35 hike
36 sit on the couch
37 cook
38 play bingo
39 go for a car ride
40 swim
41 build things
42 camping
43 canoeing
44 sewing
45 play cards
46 home improvements
47 rollerblade

Appendix D

Tables for Physical Fitness Measures

Table 7

Body Mass Index

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	27.2	26.8	0.8
	+S	6	4.7	5.9
	min	18.1	17.6	-2.7
BMI	med	26.1	26.5	-0.8
	max	47.2	35.2	19.6
	mode	18.1	17.6	-2.7
	N	27	22	22

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	24	24.1	-0.7
	+S	4.6	2.6	0.9
	min	17.3	18.2	-2.1
BMI	med	24.1	24.8	-0.6
	max	37.5	27.3	0.8
	mode	17.3	178.2	-2.1
	N	27	22	11

Table 8

Systolic Blood Pressure

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	121.5	123.3	-1.5
	±S	9.7	10.8	10.3
	min	108	110	-30
SYS	med	120	125	0
	max	138	150	14
	mode	110	130	0
	N	28	22	22

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	118.8	117.5	0
	±S	7.9	9.9	7.7
	min	108	108	-16
SYS	med	118	110	0
	max	140	136	8
	mode	118	110	0
	N	25	13	10

Table 9

Diastolic Blood Pressure

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	80.1	80.1	1.1
	±S	9.5	10.3	6.9
	min	62	50	-12
DIA	med	81	80	0
	max	98	100	14
	mode	80	80	0
	N	28	22	22

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	77.1	77.8	0.6
	±S	7	7.8	5.7
	min	68	68	-12
DIA	med	78	78	1
	max	92	92	10
	mode	80	70	-2
	N	25	13	10

Table 10

Resting Heart Rate

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	82.7	79.4	2.7
	±S	14	12	12.7
	min	60	54	-30
RHR	med	79	84	0
	max	120	96	30
	mode	72	84	0
	N	28	19	19

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	78.2	82.1	-2.7
	±S	16.3	14.4	15.6
	min	48	60	-36
RHR	med	78	78	0
	max	132	108	18
	mode	72	72	-6
	N	25	12	9

Table 11

Cholesterol

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	3.8	4.2	-0.2
	±S	0.9	1.4	1.2
	min	2.6	2.6	-2.7
CHOL	med	3.7	4	-0.1
	max	5.6	7.7	2.6
	mode	2.6	2.6	-2.7
	N	27	22	21

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	4.0	4.3	-0.6
	±S	1.3	1.1	1.7
	min	2.5	2.6	-2.7
CHOL	med	3.7	4.3	-0.7
	max	7	5.8	2.4
	mode	2.6	2.6	-2.7
	N	24	14	11

Table 12

Body Fat For Women

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	23.7	23.4	-3.5
	±S	5.1	3.5	2.9
	min	17.3	17.6	-7.7
BODYFAT	med	23.1	24.7	-
WOMEN	max	31.5	28.2	.2
	mode	17.3	17.6	-
	N	10	9	9

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	21.8	27.6	-2.7
	±S	7.7	5.1	3.4
	min	10.7	20.1	-6.8
BODYFAT	med	21.1	29.3	-
WOMEN	max	33.1	31.7	1.4
	mode	10.7	20.1	-
	N	10	4	4

Table 13

Body Fat For Men

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	25	25.7	-.8
	+S	4.6	5.3	2.2
	min	11.1	12.2	-4.5
BODYFAT	med	25.9	25.4	-
MEN	max	32.2	32.9	3.2
	mode	11.1	12.2	-
	N	18	13	13

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	21.5	21.7	-.9
	±S	6.2	5.2	2.0
	min	9.1	12.2	-4.6
BODYFAT	med	22.9	23.2	-
MEN	max	29.9	28	2.8
	mode	9.1	12.2	-
	N	18	10	10

Table 14

Push Ups

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	23	25	-1.4
	±S	7.5	7	4.2
	min	4	6	-10
PUSH	med	23	28	-0.5
	max	34	33	6
	mode	23	30	0
	N	27	21	20

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	23	23	0.2
	±S	9.8	6.4	4.6
	min	3	14	-6
PUSH	med	22	23.5	-1
	max	41	32	11
	mode	31	30	-2
	N	25	14	11

Table 15

Sit Ups

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	24.7	23	0.2
	±S	7.5	10	10.7
	min	10	1	-14
SIT	med	25	28	-0.5
	max	38	30	26
	mode	15	30	-14
	N	27	21	20

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	25.8	23.1	-0.2
	±S	8.3	8.7	9.2
	min	6	0	-19
SIT	med	29.5	24	1.5
	max	36	35	9
	mode	30	30	8
	N	24	14	10

Table 16

Average Flexibility

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	26.9	26	0.7
	±S	9.5	11.7	8.1
	min	10.3	6.3	-7.4
AVEFLEX	med	26.9	25.9	-1.2
	max	44.3	43.5	23.3
	mode	21.7	15.3	-6
	N	28	22	22

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	27.8	25.7	2.5
	±S	8.8	12.2	8.7
	min	10.7	0	-3.5
AVEFLEX	med	29	28.4	-1.2
	max	42.7	42	25.1
	mode	23.3	0	-3.5
	N	25	14	11

Table 17

Hand Grip

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	39.3	35.6	3.1
	±S	11.7	13.6	5.5
	min	21.8	12.6	-13.3
HNDGRP	med	38.7	37.5	4
	max	61.2	58.6	10.9
	mode	21.8	12.6	-13.3
	N	28	22	22

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	39.5	33.6	11
	±S	10.9	9.6	11.4
	min	14.5	15.5	-3.5
HNDGRP	med	41.1	36.4	3.8
	max	54.7	44.5	39.2
	mode	39.5	44.5	-3.5
	N	24	14	11

Table 18

V02

		Pre-Intervention	Post-Intervention	Difference
Group 1	x	38.4	38.2	0.04
	±S	2.6	2.6	2.3
	min	32.6	33.6	-6.36
VO2	med	38.1	38.2	38.1
	max	42.7	44.6	42.7
	mode	32.6	33.6	32.6
	N	24	21	24

		Pre-Intervention	Post-Intervention	Difference
Group 2	x	40.3	40.6	1.5
	+S	3.7	2.6	2.2
	min	31.8	36.9	-1.56
VO2	med	40.8	40.3	1.8
	max	47.1	46.1	4.7
	mode	31.8	36.9	-1.56
	N	22	14	10

Appendix E

Tables for the Job Description Index

Table 20

Job Decription Index Section 1: Work On Present Job

		Pre-Intervention	Post-Intervention
Group 1	x	-0.5	-01
	±S	4.1	3.7
	min	-8	-6
JDITOT 1	med	0	0
	max	8	6
	mode	0	0
	N	28	16

		Pre-Intervention	Post-Intervention
Group 2	x	6.4	6.1
	±S	4.8	5
	min	-4	-3
JDITOT 1	med	7.5	8
	max	12	12
	mode	9	8
	N	28	9

		Pre-Intervention	Post-Intervention
Group 3	x	6.8	6.3
	±S	4	2.7
	min	-4	0
JDITOT 1	med	7	7
	max	13	10
	mode	6	7
	N	25	10

Table 21

Job Decription Index Section 2: Present Pay

		Pre-Intervention	Post-Intervention
Group 1	x	1.1	1.4
	±S	4.0	4.1
	min	-8	-6
JDITOT 2	med	0.5	1.5
	max	8	7
	mode	-2	0
	N	28	10

		Pre-Intervention	Post-Intervention
Group 2	x	1.1	1.4
	±S	4.0	4.1
	min	-8	-6
JDITOT 2	med	0.5	1.5
	max	8	7
	mode	-2	0
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	0.5	2.7
	±S	4.4	6.8
	min	-8	-8
JDITOT 2	med	1	4.5
	max	6	9
	mode	0	9
	N	24	6

Table 22

Job Decription Index Section 3: Oportunities For Promotion

		Pre-Intervention	Post-Intervention
Group 1	x	1.7	2.9
	±S	5.7	6.5
	min	-8	-9
JDITOT 3	med	3	5
	max	9	9
	mode	9	9
	N	28	16

		Pre-Intervention	Post-Intervention
Group 2	x	3	3.7
	±S	5.9	5.6
	min	-9	-7
JDITOT 3	med	5	5
	max	9	9
	mode	9	9
	N	27	10

		Pre-Intervention	Post-Intervention
Group 3	x	0.6	2.6
	±S	5.3	6.8
	min	-7	-8
JDITOT 3	med	0.5	4.5
	max	9	9
	mode	-5	9
	N	24	6

Table 23

Job Decription Index Section 4: Supervision On Present Job

		Pre-Intervention	Post-Intervention
Group 1	x	12.5	16
	±S	6.5	3.6
	min	-4	8
JDITOT 4	med	15	17
	max	19	19
	mode	15	19
	N	28	16

		Pre-Intervention	Post-Intervention
Group 2	x	13.9	13.5
	±S	5.3	5.8
	min	2	1
JDITOT 4	med	15.5	14.5
	max	20	19
	mode	17	19
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	13.7	15
	±S	4.1	3.2
	min	1	9
JDITOT 4	med	14	15
	max	19	19
	mode	17	15
	N	22	8

Table 24

Job Decription Index Section 5: People On Your Present Job

		Pre-Intervention	Post-Intervention
Group 1	x	12.1	12.4
	±S	6.1	4.3
	min	-4	2
JDITOT 5	med	14	13
	max	18	18
	mode	12	14
	N	29	16

		Pre-Intervention	Post-Intervention
Group 2	x	12.4	13
	±S	4.7	5.8
	min	1	0
JDITOT 5	med	13	14
	max	18	18
	mode	16	14
	N	28	9

		Pre-Intervention	Post-Intervention
Group 3	x	13.5	14.4
	±S	4	2.1
	min	6	10
JDITOT 5	med	15	15
	max	18	16
	mode	16	15
	N	22	7

Appendix F

Tables for the Fishbein Questionnaire

Table 25

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	8.6	9.2
	±S	10.1	6.3
	min	1	1
ATT 1	med	6	9
	max	49	24
	mode	4	4
	N	27	18

		Pre-Intervention	Post-Intervention
Group 2	x	8.1	10.2
	±S	8.1	14.4
	min	1	1
ATT 1	med	6	4
	max	36	49
	mode	4	4
	N	27	10

		Pre-Intervention	Post-Intervention
Group 3	x	9.3	11.9
	±S	6.6	13.3
	min	2	1
ATT 1	med	8	6
	max	24	44
	mode	4	4
	N	24	11

Table 26

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	3	3.4
	±S	2.7	2.6
	min	1	1
ATT 2	med	2	4
	max	14	9
	mode	1	1
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	2.1	2.7
	±S	1.6	1.9
	min	1	1
ATT 2	med	2	2.5
	max	8	6
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	3.2	2.7
	±S	2.3	1.3
	min	1	1
ATT 2	med	3	3
	max	10	4
	mode	4	4
	N	26	11

Table 27

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	3.4	4.1
	±S	2.6	2.9
	min	1	1
ATT	med	3.5	4
	max	12	9
	mode	4	4
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	3.2	3.4
	±S	1.9	2.4
	min	1	1
ATT 3	med	3	3
	max	6	6
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	4.3	3.5
	±S	2.9	1.4
	min	1	1
ATT 3	med	4	4
	max	12	6
	mode	4	4
	N	26	11

Table 28

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	2.9	3.5
	±S	2.0	2.7
	min	1	1
ATT 4	med	3	3
	max	9	9
	mode	1	1
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	2.6	2.9
	±S	1.5	2.1
	min	1	1
ATT 4	med	2	2.5
	max	6	6
	mode	2	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	3.4	2.8
	±S	2.4	1.3
	min	1	1
ATT 4	med	3.5	3
	max	10	4
	mode	4	4
	N	26	11

Table 29

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	9.6	12.8
	±S	4.5	11
	min	1	1
ATT 5	med	9	12
	max	18	49
	mode	12	12
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	13.1	15
	±S	11	13.3
	min	4	6
ATT 5	med	10.5	10.5
	max	49	49
	mode	12	6
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	13.5	13.9
	±S	10.1	11.4
	min	2	4
ATT 5	med	12	10
	max	49	42
	mode	12	6
	N	25	11

Table 30

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	2.7	3.7
	±S	1.8	2.9
	min	1	1
ATT 6	med	2.5	4
	max	9	9
	mode	4	1
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	2.7	3
	±S	1.6	2.6
	min	1	1
ATT 6	med	2	2.5
	max	6	9
	mode	4	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	3.7	3.2
	±S	3.8	1.7
	min	1	1
ATT 6	med	3	4
	max	16	6
	mode	4	4
	N	26	11

Table 31

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	2.7	3.7
	±S	1.8	2.6
	min	1	1
ATT 7	med	2	3.5
	max	9	9
	mode	2	1
	N	29	18

		Pre-Intervention	Post-Intervention
Group 2	x	2.9	3.5
	±S	1.8	2.8
	min	1	1
ATT 7	med	2	3
	max	6	9
	mode	1	1
	N	27	10

		Pre-Intervention	Post-Intervention
Group 3	x	3.4	3.2
	±S	2.9	1.5
	min	1	1
ATT 7	med	3.5	4
	max	15	6
	mode	14	4
	N	26	11

Table 32

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	3.3	4.2
	±S	3.2	3.8
	min	1	1
ATT 8	med	2	4
	max	16	16
	mode	1	1
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	4.2	2.8
	±S	4.2	2.0
	min	1	1
ATT 8	med	2	2
	max	16	6
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	4.5	4.5
	±S	3.9	3.4
	min	1	1
ATT 8	med	4	4
	max	16	12
	mode	4	4
	N	26	11

Table 33

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	35.8	38.7
	±S	12.5	11
	min	7	7
ATT 9	med	36	36
	max	49	49
	mode	49	49
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	40.6	35.7
	±S	9	12.6
	min	16	18
ATT 9	med	42	35
	max	49	49
	mode	49	49
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	30.7	26.2
	±S	12.4	12.8
	min	2	7
ATT 9	med	32.5	28
	max	49	42
	mode	42	35
	N	26	11

Table 34

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	3.9	4.5
	±S	2.9	3.6
	min	1	1
ATT 10	med	3.5	4
	max	12	12
	mode	1	4
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	4.5	3.2
	±S	5.6	2.7
	min	1	1
ATT 10	med	3	2.5
	max	28	9
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	4.3	4.5
	±S	4.1	1.6
	min	1	2
ATT 10	med	4	4
	max	16	8
	mode	4	4
	N	26	11

Table 35

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	8.2	9.4
	±S	5.2	5.5
	min	1	1
ATT11	med	8.8	9
	max	20	16
	mode	9	16
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	8.0	5.8
	±S	6.3	7.2
	min	1	1
ATT11	med	8	4
	max	28	25
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	10.1	6.7
	±S	7.0	4.1
	min	1	2
ATT 11	med	8.5	6
	max	30	16
	mode	16	6
	N	26	11

Table 36

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	3.9	4.4
	±S	2.3	3.0
	min	1	1
ATT 12	med	4	4
	max	9	9
	mode	4	4
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	3.9	3.9
	±S	2.5	3.1
	min	1	1
ATT 12	med	4	3
	max	9	9
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	4.9	4.4
	±S	5.4	2.1
	min	1	1
ATT 12	med	4	4
	max	25	8
	mode	4	4
	N	26	11

Table 37

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	3.7	4.9
	±S	2.5	3.5
	min	1	1
ATT 13	med	3	4
	max	9	12
	mode	2	1
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	4.1	3.5
	±S	2.8	2.8
	min	1	1
ATT 13	med	4	2.5
	max	12	8
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	5.5	4.9
	±S	5.5	2.3
	min	1	1
ATT 13	med	4	4
	max	24	9
	mode	4	4
	N	26	11

Table 38

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour

		Pre-Intervention	Post-Intervention
Group 1	x	7.6	7.2
	±S	9.2	4.3
	min	1	1
ATT 14	med	6	6
	max	49	12
	mode	2	12
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	6.7	5.5
	±S	6.4	4.5
	min	1	1
ATT 14	med	4	4
	max	25	15
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	7	10
	±S	4.8	8.7
	min	1	4
ATT 14	med	4	6
	max	16	30
	mode	4	4
	N	25	9

Table 39

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	3.	2.8
	±S	2.1	1.7
	min	1	1
BB1	med	2	2
	max	7	6
	mode	2	2
	N	29	12

		Pre-Intervention	Post-Intervention
Group 2	x	13.6	3
	±S	0.9	2.1
	min	1	1
BB1	med	1	3
	max	4	7
	mode	1	1
	N	28	8

		Pre-Intervention	Post-Intervention
Group 3	x	3.2	2.7
	±S	1.8	1.3
	min	1	1
BB1	med	2	3
	max	7	5
	mode	2	3
	N	25	11

Table 40

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	1.6	1.5
	±S	1.2	0.7
	min	1	1
BB2	med	1	1
	max	6	3
	mode	1	1
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	1.6	1.4
	±S	0.9	0.5
	min	1	1
BB2	med	1	1
	max	4	2
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	1.6	1.7
	±S	0.7	0.5
	min	1	1
BB2	med	2	2
	max	3	2
	mode	1	2
	N	25	11

Table 41

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	1.9	1.8
	±S	1.8	0.9
	min	1	1
BB3	med	2	2
	max	7	4
	mode	2	1
	N	29	17

		Pre-Intervention	Post-Intervention
Group 2	x	2.0	2
	±S	0.9	1.2
	min	1	1
BB3	med	2	2
	max	5	5
	mode	2	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	2.3	2.2
	±S	1.2	0.8
	min	1	1
BB3	med	2	2
	max	5	3
	mode	2	2
	N	25	11

Table 42

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	8.2	8.1
	±S	7.1	5.8
	min	1	1
BB4	med	6	8
	max	28	25
	mode	4	9
	N	29	18

		Pre-Intervention	Post-Intervention
Group 2	x	7.1	6.7
	±S	6.8	6.4
	min	1	1
BB4	med	6	4
	max	35	21
	mode	6	4
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	10	10.1
	±S	7.6	7.2
	min	1	3
BB4	med	9	9
	max	30	24
	mode	4	4
	N	25	9

Table 43

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	6.8	6.4
	±S	5.6	4.5
	min	1	1
BB5	med	4	5
	max	20	16
	mode	4	4
	N	29	18

		Pre-Intervention	Post-Intervention
Group 2	x	7.0	6
	±S	5.7	5.7
	min	1	1
BB5	med	6	3
	max	24	16
	mode	6	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	8.2	6.2
	±S	6.8	3.8
	min	1	3
BB5	med	6	5
	max	25	16
	mode	4	4
	N	25	11

Table 44

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	3.8	3.0
	±S	8.8	2.6
	min	1	1
BB6	med	2	2
	max	49	9
	mode	1	1
	N	29	18

		Pre-Intervention	Post-Intervention
Group 2	x	2.3	2.5
	±S	1.5	1.8
	min	1	1
BB6	med	2	1.5
	max	6	6
	mode	1	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	2.9	3.6
	±S	2.4	4.4
	min	1	1
BB6	med	2	2
	max	4	16
	mode	2	1
	N	25	11

Table 45

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	8.8	8.3
	±S	9.9	6.2
	min	1	1
BB7	med	6	6
	max	49	25
	mode	4	12
	N	29	18

		Pre-Intervention	Post-Intervention
Group 2	x	7.1	6.5
	±S	4.8	6
	min	1	1
BB7	med	6	4
	max	20	16
	mode	6	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	10.6	8.3
	±S	7.3	5.0
	min	2	2
BB7	med	9	6
	max	28	16
	mode	9	4
	N	24	11

Table 46

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	1.9	2
	±S	1	1
	min	1	1
BB8	med	2	2
	max	4	4
	mode	1	2
	N	30	18

		Pre-Intervention	Post-Intervention
Group 2	x	1.9	2
	±S	0.8	0.8
	min	1	1
BB8	med	2	2
	max	4	3
	mode	2	2
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	2.2	2.2
	±S	0.9	1.3
	min	1	1
BB8	med	2	2
	max	5	4
	mode	2	1
	N	25	11

Table 47

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	7.2	8
	±S	3.8	2.7
	min	1	3
BB9	med	6	8.5
	max	18	12
	mode	6	9
	N	28	18

		Pre-Intervention	Post-Intervention
Group 2	x	7.9	7.7
	±S	3.8	4.5
	min	3	3
BB9	med	7	6.5
	max	18	15
	mode	6	3
	N	27	10

		Pre-Intervention	Post-Intervention
Group 3	x	7.1	8.1
	±S	3.3	4.2
	min	2	2
BB9	med	6	8
	max	15	15
	mode	6	6
	N	25	11

Table 48

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	5.4	5.4
	±S	5.6	4.1
	min	1	1
BB10	med	4	4
	max	28	15
	mode	4	4
	N	29	17

		Pre-Intervention	Post-Intervention
Group 2	x	5.2	5.6
	±S	4	5.5
	min	1	1
BB10	med	5	4
	max	16	18
	mode	6	1
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	6.0	5.1
	±S	4.8	2.8
	min	1	1
BB10	med	4	4
	max	20	12
	mode	4	4
	N	25	11

Table 49

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs

		Pre-Intervention	Post-Intervention
Group 1	x	4.2	4.6
	±S	1.9	1.7
	min	1	1
BB11	med	4	5
	max	7	7
	mode	3	5
	N	29	17

		Pre-Intervention	Post-Intervention
Group 2	x	4.4	4.3
	±S	1.9	2.2
	min	1	1
BB11	med	5	4
	max	7	7
	mode	6	3
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	4.2	3.9
	±S	1.8	1.2
	min	1	2
BB11	med	5	4
	max	7	6
	mode	3	4
	N	25	11

Table 50

Fishbein and Azjen Quesitonnaire: Subjective Norm

		Pre-Intervention	Post-Intervention
Group 1	x	24	25.2
	±S	6.6	6.2
	min	8	8
SN	med	26	26.5
	max	35	35
	mode	17	27
	N	27	18

		Pre-Intervention	Post-Intervention
Group 2	x	24.5	22.9
	±S	7.9	7.3
	min	12	8
SN	med	23.5	24
	max	49	31
	mode	24	31
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	27.2	26
	±S	7.0	9.2
	min	17	12
SN	med	24	26.5
	max	43	46
	mode	22	28
	N	25	10

Table 51

Fishbein and Azjen Quesitonnaire: Attitudes Towards the Behaviour Total

		Pre-Intervention	Post-Intervention
Group 1	x	65	70.6
	±S	11.2	16.4
	min	40	40
ATT	med	63	71
	max	86	94
	mode	59	70
	N	27	18

		Pre-Intervention	Post-Intervention
Group 2	x	67	64.3
	±S	15.8	15.9
	min	41	40
ATT	med	71.5	64
	max	94	89
	mode	66	40
	N	26	10

		Pre-Intervention	Post-Intervention
Group 3	x	70.8	69
	±S	15.9	12.3
	min	49	48
ATT	med	66.5	68
	max	113	91
	mode	58	65
	N	24	9

Table 52

Fishbein and Azjen Quesitonnaire: Behavioural Beliefs Total

		Pre-Intervention	Post-Intervention
Group 1	x	39.4	42.3
	±S	10.3	9.1
	min	17	27
BB	med	39	40.5
	max	64	59
	mode	46	34
	N	27	12

		Pre-Intervention	Post-Intervention
Group 2	x	41.7	38.3
	±S	11.7	15.8
	min	19	21
BB	med	42	33
	max	63	66
	mode	47	21
	N	27	8

		Pre-Intervention	Post-Intervention
Group 3	x	44.6	43
	±S	10.8	10
	min	24	29
BB	med	45	42
	max	70	63
	mode	47	36
	N	24	9

Table 53

Fishbein and Azjen Quesitonnaire: Motivation to Comply Total

		Pre-Intervention	Post-Intervention
Group 1	x	22.5	23.2
	±S	6.6	6.4
	min	23	17
MC	med	42	23
	max	18	42
	mode	24	23
	N	29	18

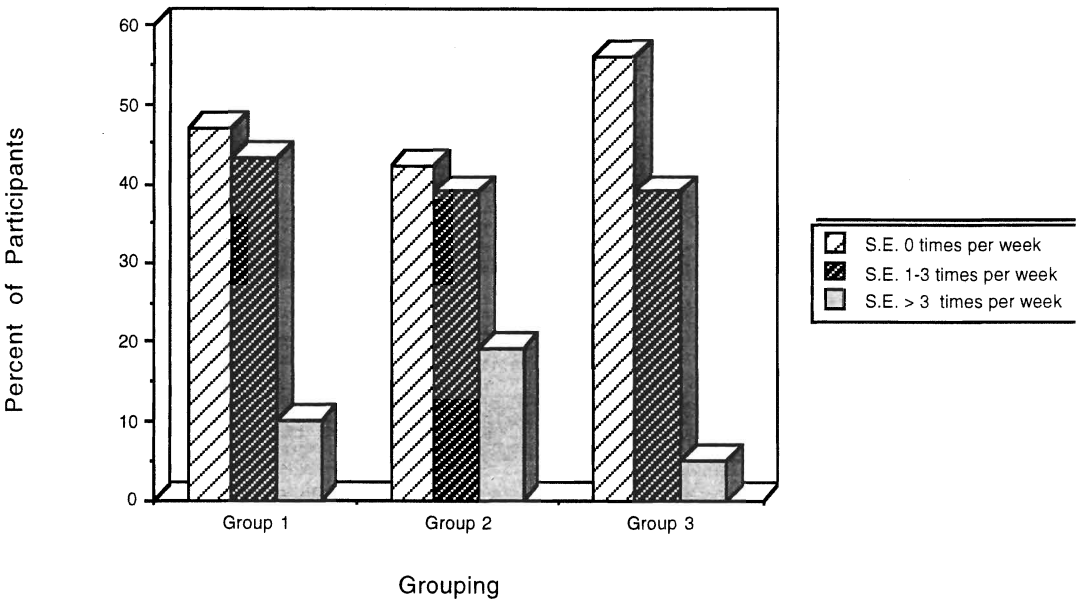
		Pre-Intervention	Post-Intervention
Group 2	x	22.2	22.2
	±S	8.1	9.3
	min	6	6
MC	med	22.5	23
	max	42	36
	mode	24	24
	N	28	10

		Pre-Intervention	Post-Intervention
Group 3	x	22.8	23
	±S	6.2	5.9
	min	14	15
MC	med	22	23
	max	37	36
	mode	24	24
	N	25	11

Appendix G

Graph for Weekly Strenuous Exercise

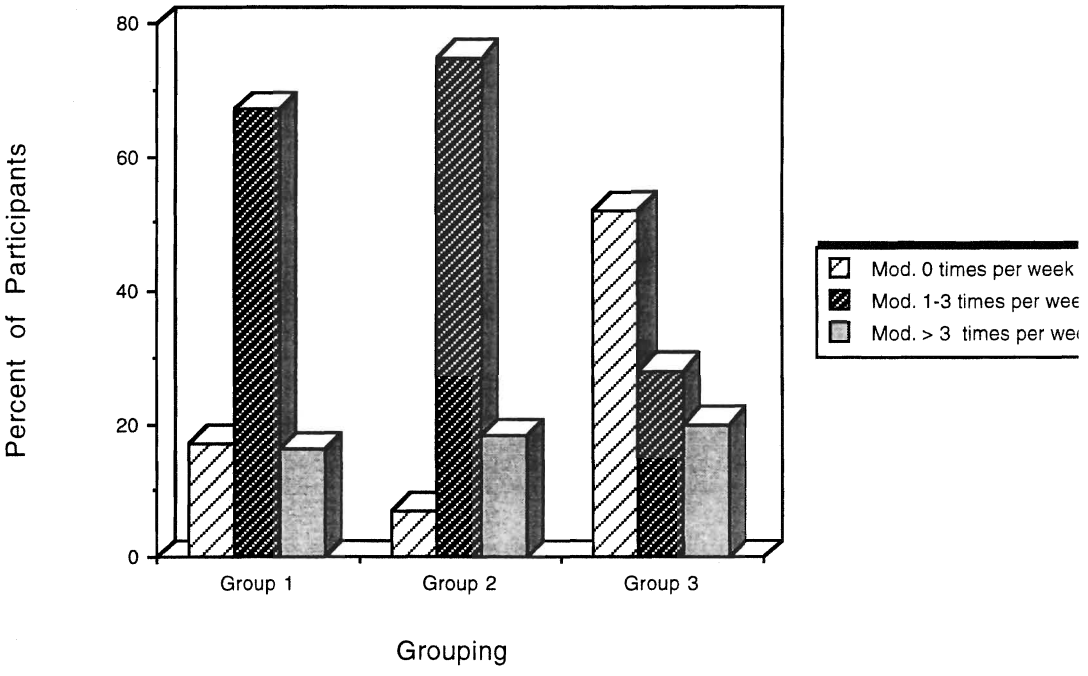
Figure 2. Weekly Strenuous Exercise



Appendix H

Graph for Weekly Moderate Exercise

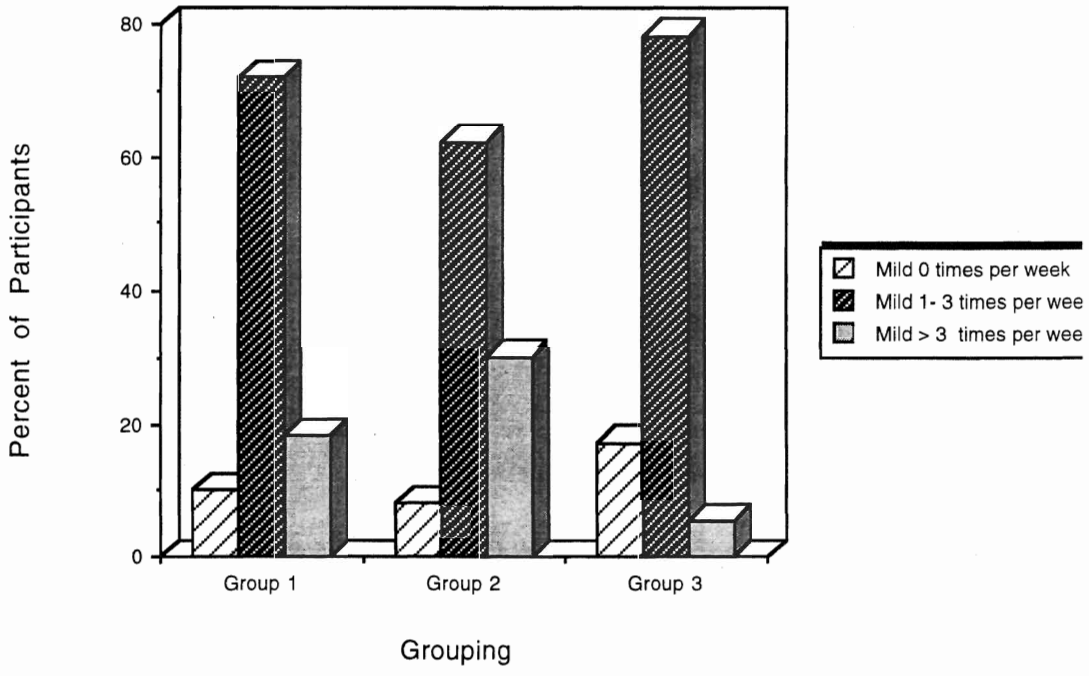
Figure 3. Weekly Moderate Exercise



Appendix I

Graph for Weekly Mild Exericse

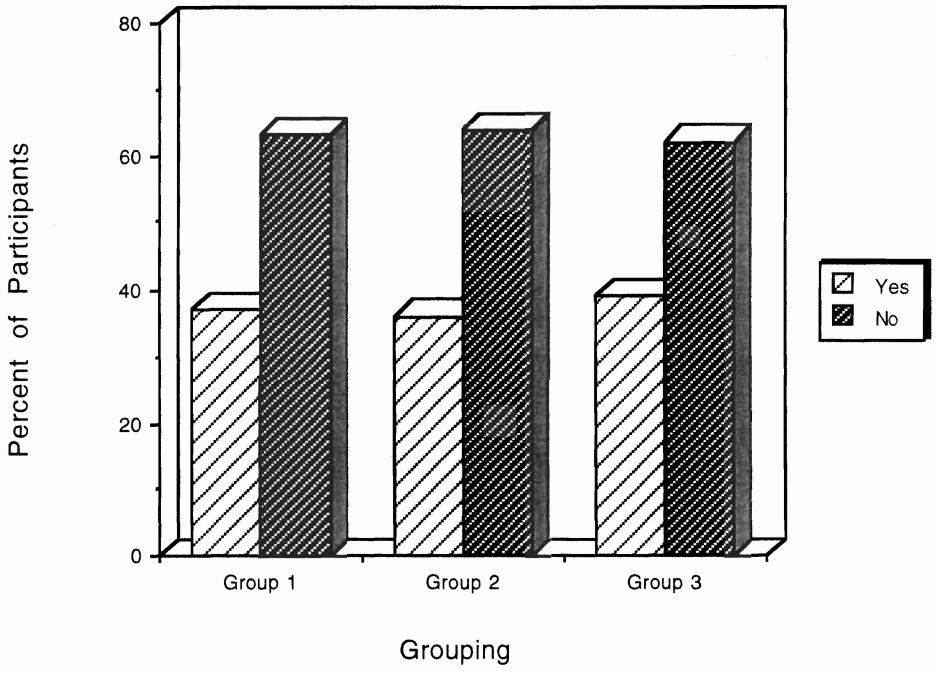
Figure 4. Weekly Mild Exercise



Appendix J

Graph of Leisure Pursuits Limited Due to Health

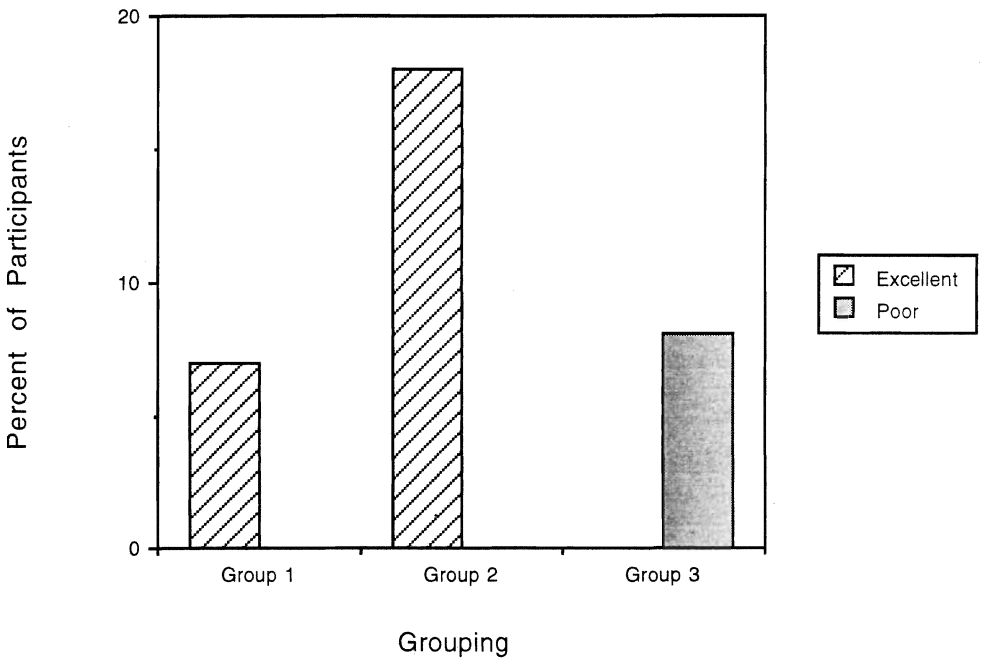
Figure 5. Leisure Pursuits Limited Due to Health



Appendix K

Graph of Health Status

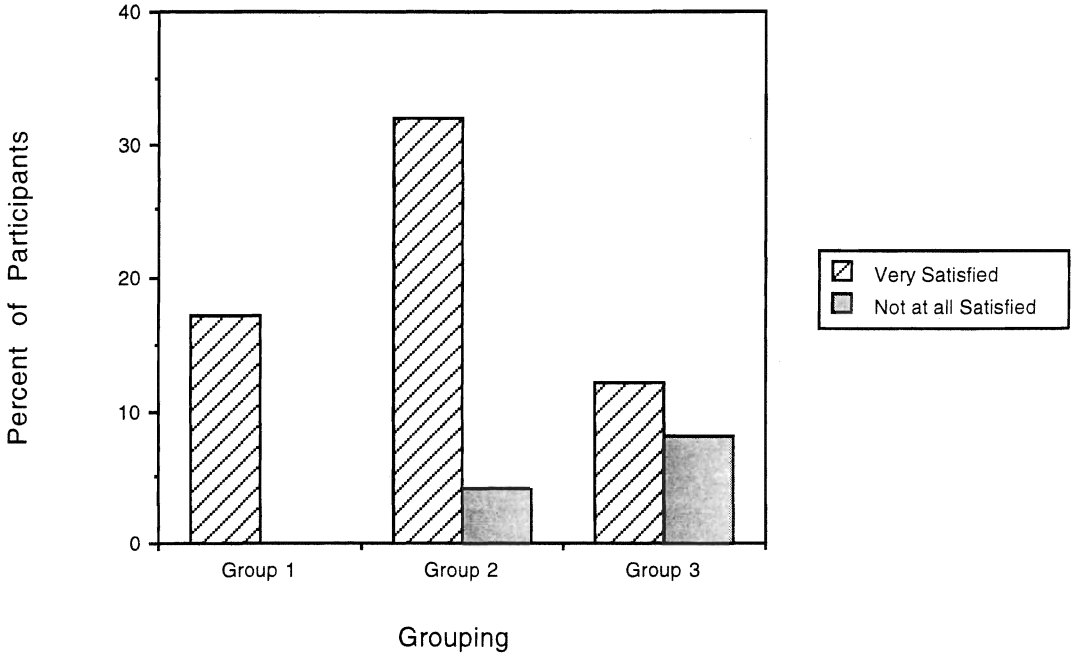
Figure 6. Health Status Rating



Appendix L

Graph of
Satisfaction With Health

Figure 7. Satisfaction With Health



Appendix M

Questionnaire

WORKPLACE WELLNESS STUDY

A collaborative project between

Canadian Tire Acceptance Limited

and

Brock University

Letter of Informed Consent

I _____, understand that the purpose of this research project is to measure attitudes and behaviours toward exercise.

The project and the researchers expectations have been explained to me in detail, and I have had the opportunity to ask any questions regarding this project.

I understand that I am expected to complete a questionnaire which intends to evaluate specific aspects of my lifestyle, perceived health and well being. The forms will be completed on two occasions, separated by an interval of twelve weeks. On each occasion, completion of the questionnaire will occupy 20 minutes.

I understand that I may take the questionnaire home and complete it during my leisure, returning the questionnaire the next day. All information that is provided will be kept by the investigators in strict confidence.

I am aware that I reserve the right to refuse to answer any questions or continue my involvement in this study at any time.

Further, I understand that my involvement in this research project will be kept in strictest confidence between the researchers and myself.

Signed: _____ Date: _____

Witness: _____ Date: _____

I.D. # _____

Life Satisfaction Assessment

Here are some statements about life in general that people feel differently about. Would you read each statement on the list, and if you agree with it, put a check mark in the space under "AGREE". If you do not agree with a statement, put a check mark in the space under "DISAGREE". If you are not sure one way or the other, put a check mark in the space under "?". Please be sure to answer every question on the list.

	AGREE	DISAGREE	?
1. As I grow older, things seem better than I thought they would be.	—	—	—
2. I have gotten more of the breaks in life than most of the people I know.	—	—	—
3. This is the dreariest time of my life.	—	—	—
4. I am just as happy as when I was younger.	—	—	—
5. My life could be happier than it is now.	—	—	—
6. These are the best years of my life.	—	—	—
7. Most of the things I do are boring or monotonous.	—	—	—
8. I expect some interesting and pleasant thing to happen to me in the future.	—	—	—
9. The things I do are as interesting to me as they everwere.	—	—	—
10. I feel old and somewhat tired.	—	—	—
11. I feel my age, but it does not bother me.	—	—	—
12. As I look back on my life I am fairly well satisfied.	—	—	—
13. I would not change my life even if I could.	—	—	—
14. Compared to other people my age, I've made a lot of foolish decisions in my life.	—	—	—
15. Compared to other people my age, I make a good appearance.	—	—	—
16. I have made plans for things I'll be doing a month or a year from now.	—	—	—
17. When I think back over my life, I didn't get most of the important things I wanted.	—	—	—
18. Compared to other people, I get down in the dumps too often.	—	—	—
19. I've gotten pretty much what I expected out of life.	—	—	—
20. In spite of what people say, the lot of the average man is getting worse, not better.	—	—	—

JOB DESCRIPTION INDEX

 Patricia C. Smith, Cornell University

In this questionnaire please respond by using a "Y" or an "N" or a "?" in the blank beside each word given.

WORK ON PRESENT JOB

Think of your present work, what is it like most of the time?

___ Fascinating	___ Routine	___Satisfying	___Boring
___Good	___Creative	___Respected	___Hot
___Pleasant	___Useful	___Tiresome	___Healthful
___Challenging	___On your feet	___Frustrating	___Simple
___Endless	___Gives sense of accomplishment		

PRESENT PAY

Think of the pay you get now. How well does each of the following words describe your present pay?

Income adequate for normal expenses	___	Satisfactory	___
Barely live on income	___	Bad	___
Income provides luxuries	___	Less than I deserve	___
Highly paid	___	Underpaid	___

OPPORTUNITIES FOR PROMOTION

Think of the opportunities for promotion you have now. How well does each of the following words describe these?

Good opportunities for promotion	___	Opportunity somewhat limited	___
Promotion on ability	___	Dead-end job	___
Good chance for promotion	___	Unfair promotion policy	___
Infrequent promotions	___	Regular promotions	___
Fairly good chance for promotion	___		

SUPERVISION ON PRESENT JOB

Think of the kind of supervision that you get on your job.
How well does each of the following words describe this supervision?

Asks my advice	___	Hard to please	___	Quick tempered	___
Praises good work	___	Tactful	___	Influential	___
Around when needed	___	Impolite	___	Annoying	___
Doesn't supervise enough	___	Knows job well	___	Intelligent	___
Tells me where I stand	___	Stubborn	___	Bad	___
Leaves me on my own	___	Up to date	___	Lazy	___

PEOPLE ON YOUR PRESENT JOB

Think of the majority of the people that you work with now or the people you meet in connection with your work.
How well does each of the following words describe this these people?

Stimulating	___	Boring	___	Slow	___
Ambitious	___	Stupid	___	Responsible	___
Fast	___	Intelligent	___	Smart	___
Easy to make enemies	___	Talk too much	___	Lazy	___
Unpleasant	___	No Privacy	___	Active	___
Narrow Interests	___	Loyal	___	Hard to Meet	___

The following questions seek your opinions and comments about attitudes toward regular physical activity.

Question 1.

At the present time, I intend to do active sports or vigorous physical activities (i.e. exercise) a few times a week, during my leisure time.

is likely	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is unlikely

Question 2.

I think that doing active sports or vigorous physical activities a few times per week, during my leisure time:

is good	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is bad	makes work easier	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	makes work more difficult
is enjoyable	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is unenjoyable	improves concentration	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	worsens concentration
is exciting	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is boring	improves health	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	worsens health
is convenient	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is inconvenient	improves overall lifestyle	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	worsens overall lifestyle
is relaxing	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is stressful	is tiring	☐ extremely	☐ quite	☐ slightly	☐ neither	☐ slightly	☐ quite	☐ extremely	is invigorating

Health this last month

Please indicate how healthy you have been in the past month by placing an "x" on the line below

extremely healthy |_____| extremely unhealthy

Question 3. Generally speaking how would you describe something that:

a) helps you fill free time

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

b) helps to control your body weight

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

c) is healthy

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

d) is physically damaging

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

e) relieves tension

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

f) improves your physical appearance

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

g) helps you feel better

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

h) helps you meet people

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

i) is time consuming

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

j) improves your mental performance

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

k) helps you to be physically fit

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

l) improves your concentration

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

m) increases your energy

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

n) relieves boredom

GOOD ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely BAD

Question 4. I think that doing active sports or vigorous activities a few times per week, during my leisure time:

a) would help me fill my free time

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

b) would help me to control my body weight

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

c) would be healthy

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

d) would be physically damaging

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

e) would relieve tension

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

f) would improve my physical appearance

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

g) would help me to feel better

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

h) would help me meet people

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

i) would be time consuming

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

j) would improve my mental performance

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

k) would help me to be physically fit

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

l) would improve my concentration

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

m) would help to increase my energy

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

n) would help to relieve boredom

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

Question 5. I think that doing active sports or vigorous activities a few times per week, during my leisure time is something that:

a) people who are important to me believe I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

b) my physician believes I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

c) members of my family believe I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

d) my friends believe I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

e) my supervisor believes I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

f) the company believes I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

g) my coworkers believe I should do

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

h) would help make work easier

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

Please answer the following question with reference to your leisure pursuits:

When you are free to do whatever you want to do, what do you do?

_____

_____

_____

_____

_____

_____

Question 6. I would like to do active sports or vigorous activities:

a) the way my physician thinks I should

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

b) the way most members of my family think I should

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

c) the way my friends think I should

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

d) the way my supervisor thinks I should

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

e) the way my company thinks I should

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

f) the way my co-workers think I should

AGREE ☐ extremely ☐ quite ☐ slightly ☐ neither ☐ slightly ☐ quite ☐ extremely DISAGREE

Question 7. Considering a typical, **recent 7-day period**, how many times on average do you do the following kinds of exercise, **for more than 15 minutes during your leisure time**? (write the appropriate number on each line).

Times per week

1) strenuous exercise, causing the heart to beat rapidly.
These activities may include: running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller blading, vigorous swimming, vigorous long distance bicycling. ☐

2) moderate exercise, not exhausting.
These activities may include: fast walking, baseball, tennis, easy bicycling, vollyeball, badminton, easy swimming, alpine skiing, popular and folk dancing. ☐

3) mild exercise, minimal effort.
These activities may include: yoga, archery, fishing from a river bank, bowling, horseshoes, golf, snowmobiling, easy walking. ☐

The following questions refer to activities when you were younger.

1) Did you do any sport or vigorous physical activity during your free time when you were age 6 to 11 years?

☐ at least 3 times per week ☐ 1 to 2 times per week ☐ less than once per week

2) Did you do any sport or vigorous physical activity during your free time when you were age 12 to 17 years?

☐ at least 3 times per week ☐ 1 to 2 times per week ☐ less than once per week

The following questions refer to your current health status and involvement in activities.

	YES	NO
Is your involvement in leisure activity limited because of your health?	O	O
In the past four weeks did you take any pain relievers?	O	O
Did you take the pain relievers on the advice of your doctor?	O	O
In the past four weeks did you take any medicine for your heart or blood pressure?	O	O
Did you take this medicine on the advice of your doctor?	O	O

In general, compared to other persons your age, would you say that your health is

Excellent O Very Good O Good O Fair O Poor O

How satisfied are you with your health?

Very Satisfied O Somewhat O Not too satisfied O Not at all satisfied O

The Symptom Reporting Questionnaire

The following is a list of common symptoms and sensations. For each, please check how often you have detected the symptoms in the past three months.

headaches	eye irritation	runny/stuffy nose
sneezing nasal discomfort	tooth aches	sore throat
cough	wheezy breathing	chest pain
nausea/vomiting	stomach discomfort	swollen joints
back pain	muscle stiffness	skin irritation/ itching
excess sweating	chills	dizziness
difficulty sleeping	loss of appetite	tiring easily
weight change	shaky hands	indigestion

Thank-you for taking the time to complete this questionnaire. Please use the space below to provide comments on any aspect of the questionnaire.